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NEWSPAPER

Aerial Photos of New England

A computer helped the Army Corps of Engineers control flooding when Hurricane Belle hit New England last week by analyzing when the gates at dams like this one at Vermont's Ball Mountain should be closed down.

Belle Tests Network's Ability To Reduce Destruction by Flood

By Nancy French
Of the CW Staff

WALTHAM, Mass. – After spending most of its fury on Long Island's southern coast, Hurricane Belle swept through New England as a "mere tropical storm" last week.

Belle dumped up to six inches of rain in Vermont in about 12 hours, causing major flooding and damage to crops in the western part of the state.

But to the east along the Connecticut River basin, which stretches from Canada to the Connecticut coast, property and crops were saved from disaster by a system of flood-control dams built and controlled by the Army Corps of Engineers and an IBM 1130 computer.

Data fed to the computer from 41 remote reporting stations along the region's major river basins as well as Block Island and Old Saybrook, Conn., on Long Island Sound fed hydrological engineers here a steady stream of environmental data on the growing storm, according to Saul Cooper, chief of the corps' Water Control Branch here.

Information on river, tide or reservoir levels, precipitation, barometric pressure, wind speed and wind direction helped them decide when and how much to close the region's 35 river dams and the four

(Continued on Page 4)

Terminal Aiding in Search For 'Legion Disease' Cause

By Catherine Arnst
Of the CW Staff

A portable computer and an automated influenza surveillance system are aiding the search for the cause of the mysterious "Legionnaires' disease" which killed 27 people and hospitalized 125 others by the end of last week.

The disease appeared during an American Legion convention held in Philadelphia July 21-24 and attended by approximately 10,000 people.

Some 150 epidemiologists from both the National Center for Disease Control (NCDC) in Atlanta and the Philadelphia Department of Health are now trying to discover what caused the illnesses by questioning everyone who attended the convention – both those who fell sick and those who showed no signs of illness.

The replies to the list of 23 questions asked are being keyed into an IBM 5100 portable computer used as a terminal in Harrisburg, Pa.

This terminal transmits data by acoustic coupler over phone lines to the NCDC's IBM 370/158, which then transmits the data to a Digital Equipment Corp. PDP-11/40. Data is being analyzed on the terminal in Harrisburg; until last week this was done on the PDP-11/40.

In Atlanta, the National Influenza System, a year-old automated system used to keep track of outbreaks of influenza in the nation, was used to analyze the data. Influenza has almost entirely been ruled out as a cause of the disease, however, so the NCDC is now only compiling the data, most of the analysis is being done with the terminal in Harrisburg.

The investigators are hoping the system will produce an indication of some pattern common to all those who fell ill. Data has already been collected on those who are ill; now convention attendees who were not stricken are being interviewed.

"What we're trying to find out is what made them different. We're zooming in now on the people who didn't get sick to find that out," a public health advisor at NCDC said.

The system has been used nonstop since the beginning of August, but no patterns have emerged. Data is still being collected, however, and it's early for any similarities in cases to show up, the health advisor added.

Information on this disease is being gathered and analyzed much quicker than in past situations because of the computer hookup, according to Rick Curtis, chief of the Information Services Group of the Surveillance and Assessment Division of NCDC.

This is the first time the NCDC has placed a terminal in the field, he said, and the amount of time saved as a result "is tremendous."

Previously, disease investigators would transmit information over the phone; the terminal, however, allows for rapid data analysis both on-site and in Atlanta, Curtis said.

World Seen Approaching 'Data Spasm'

By Ronald A. Frank
Of the CW Staff

TORONTO – The world is rapidly approaching a "data spasm" of transnational data flow that operates under no restraint or accountability, according to Joseph Overton, legislative assistant to Rep. Barry Goldwater Jr. (R-Calif.).

Speaking at the recent International Conference on Computer Communication here, Overton warned a session on privacy and security issues about data flowing across international boundaries.

Such data can "frustrate and crush" the various national efforts to balance individual rights and the need to know with the protection of individual, personal and human integrity, he said.

The individual or organization can become an "informational pirate" that takes advantage of the "international legal vacuum" to pillage "informational valuables" belonging to businesses and individuals, he said.

These data pirates will be able to retreat to a safe "data haven" to utilize the information for their own gain, Overton predicted. "None of us can protect against the pirate and the potential data haven he can retreat to."

Telecommunications is as vulnerable to interception and theft as were ocean-going vessels, and international treaties and agreements on copyrights and patents are not sufficient to provide essential protections, he said.

U.S. courts still have no clear-cut legal concept of informational privacy; they have no consistent precepts of the relationship between the need to know and the right to be left alone. But many nations have gentlemen's agreements and understandings that these situations can be worked out on a case-by-case basis, Overton said.

Much of what the various nations have created to date in the area of information management can be "married" by bilateral or multilateral agreements. "We are all ignoring the individual or nation that, for other than political, ideological or sovereign reasons may pirate information. In America, Watergate, organized crime and international corporate bribery have given us a glimpse of what the potential is," he

Continued on Page 2

System Monitoring Whereabouts Of Delegates at GOP Convention

By Catherine Arnst
Of the CW Staff

KANSAS CITY, Mo. – Gerald Ford and Ronald Reagan are not the only ones keeping track of the delegates at the Republican National Convention here this week.

The Convention Committee is also accounting for the whereabouts of every delegate, journalist and anyone with official status by using a reservation tracking system implemented on the IBM 370/158 that handles this city's data processing.

The system is keeping track of 15,000 people, the hotels where they are registered and the group or state with which they are affiliated. It was developed by the city as part of $500,000 worth of services the city offered the committee in return for holding the convention here.

The Convention Housing Committee asked Kansas City in February to develop a computerized reservation system to handle the 110 hotels and motels being used for the convention, according to Kenneth Ruhnke, manager of computer facilities for the city.

Surprised at Success

The system was developed in-house from scratch, Ruhnke said, adding that the system is working excellently, "quite to our surprise. We didn't have any experience with this sort of thing; our experi-

(Continued on Page 2)

EFT to Save Banks Annual $700 Million By 1983: ABA Officer

MIAMI – An estimated 2 billion future retail transactions using electronic funds transfer (EFT) systems could save banks $700 million annually, according to Willis W. Alexander, executive vice-president of the American Bankers Association (ABA).

"An ever-increasing number of consumers are using EFT terminals that permit funds to be debited and credited to bank accounts via an electronic communications network, thus eliminating the need for the exchange of cash or checks," he said at the First Interamerican Bankers Conference here recently.

"Of the 80 billion retail transactions predicted for the nation in 1983, some

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Tied to CPU in New York

Minis Set to Relay Delegates' Choices

KANSAS CITY, Mo. – As soon as each state delegation at the Republican National Convention here this week casts its votes to nominate a Presidential candidate, television news correspondents will report the tally using two minicomputers.

The Digital Equipment Corp. PDP-11/04s will provide the voting information to the three television networks covering the convention. The "pool" information supplied to the networks will come from a special election display system developed by AGS Computers, Inc. of New York.

The DEC minis, tied by a leased telephone line to an IBM 370/155 at CBS-TV in New York City, will be used to receive and display the cumulative votes.

As each delegation is polled, votes will be input via a CRT terminal here. The data will be forwarded over the communications link to New York for massaging and additional analysis if necessary, according to Joe Cunningham of AGS Computers.

Additional data about the candidates and members of each delegation as well as the results will then be returned to the convention site in a format designed for easy broadcasting, he explained.

The minis also will be used to drive a Vidifont – a device that converts digital data into numerical pictures that may be used directly on a television screen. These pictures will be sent to the local control rooms of each network for use at their convenience.

A similar system was used at the Democratic Convention in New York [CW, July 19].

System Monitors GOP Delegates

(Continued from Page 1)

ence is with more typical governmental applications.

Written in Cobol and run in IBM's Customer Information Control System (CICS) environment, the system cost $6,000 to $7,000 to develop, Ruhnke said.

The data for the system was obtained from preprinted forms sent out by the Convention Committee to each state delegation and other groups that planned to be at the convention. The forms included the hotel, group name and a registration number, and were then filled out with the convention attendees' names and their room requirements.

The information was then keypunched in by the city's DP department. When all the data had been entered in late May, the system was ready to print out lists by last name, hotel, state delegation, group affiliation and registration number.

At the convention housing office, set up at the Radisson Muehlebach Hotel, the staff is using an IBM 3275 terminal and IBM 3284 printer lent to it by the city to update the data when changes are made and to obtain information on the whereabouts of any attendee. The system is also capable of receiving and forwarding a 20-word message for an attendee.

The only support the city is giving the system at this point is updating the printout every few days, Ruhnke said. DP chores for the city have not backed up because "we had a long leadtime for developing the system," he added.

Ruhnke believes this is the first successful system of its type to be developed by a city. A similar attempt was made in 1972 by San Diego, which was originally slated to be the site of that year's Republican convention. The convention was moved to Miami, however, and that city abandoned the idea after they found it to be a "Herculean task," he said.

Kansas City has no plans for the system once the convention is over, but Ruhnke theorized that "the convention people might like to have it."

The Convention Housing Committee would probably agree. "It serves our purpose perfectly," according to Maxine Cooper, assistant to the chairman of the committee.

World Seen Near 'Data Spasm'

(Continued from Page 1)

said.

Telecommunications satellites and microwave communications can be intercepted, signals separated and deciphered. The increasing availability of communications equipment has brought "each of us to the brink of individual international communication capability. All that is so far thankfully missing . . . is a deliberate, organized effort to do it as a business."

The incentives for data piracy are great, and information that previously had only national significance now has international value. And such information can be acquired and utilized almost instantly, Overton said.

Nations and concerned individuals will have to consider how to cope with the data haven potential. "I consider it a probability that data havens will develop; the world has renegades and pirates in every human activity. To fail to come to grips with this problem may well mean informational technology will overcome its own master."

He called on nations to make compatible freedom of information and personal privacy, to humanize information practice and to intelligently marry various national efforts with those of other nations.

Among the nations currently engaged in legislative efforts concerning the control of data flow, Overton listed the U.S., Canada, Germany, Sweden, Norway, Austria, England, The Netherlands, France, Japan, Australia and others "demonstrating more than a passing interest in such national legislation."

Viking Project Spared DP Problems So Far

PASADENA, Calif. – Although scientists at the National Aeronautics and Space Administration's Jet Propulsion Laboratory (JPL) here have experienced difficulties with the telescoping arm of Viking I's soil sampler, no computer problems have developed.

According to a source at JPL, there have not been any problems with the two miniature computers on board the craft visiting the Martian surface [CW, July 12].

In addition to the equipment 215 million miles from home, "no unusual problems with the [computer system] ground equipment here have developed" and no mishaps in transmitting the Viking data have occurred, the JPL spokesman said.

There is the possibility, however, that some snags may develop when Viking I's sister ship, Viking II, goes into orbit this week. The second spacecraft may cause a load on the JPL computer systems "because three sources of data will be transmitting at the same time," he explained.

Should computer difficulties develop on the planet, it may be difficult – at the very least – to find on-site service representatives to restore the systems.

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Next, just to make certain that everything was really on the up and up, IBM dispatched one of their technical people to serve as their representative.

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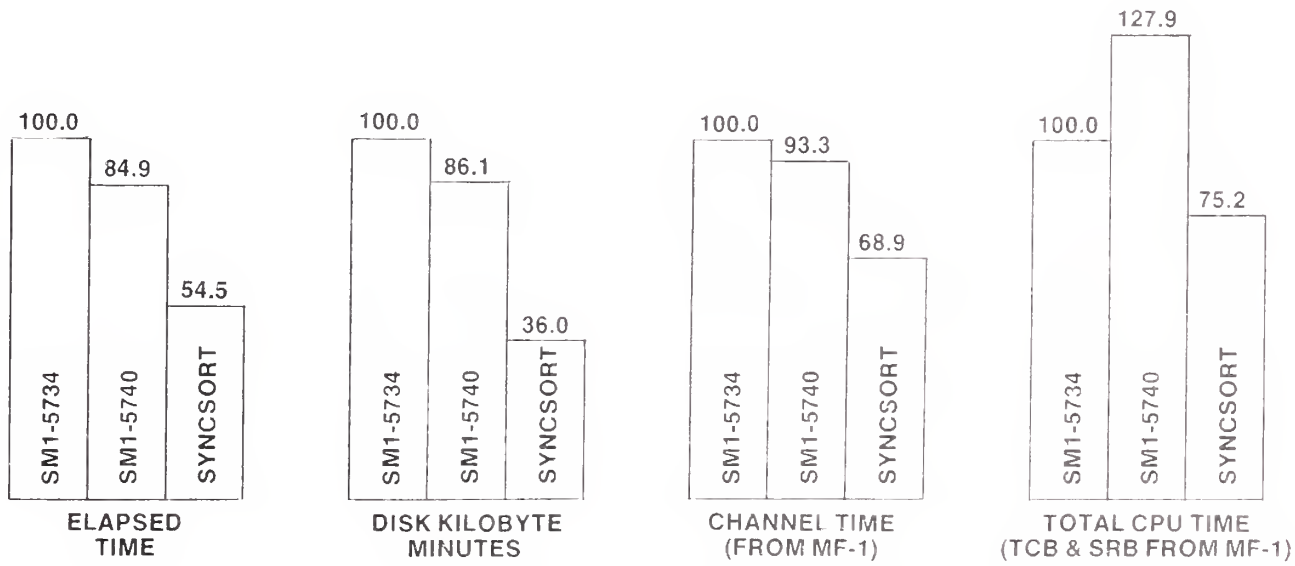
Finally, the moment of truth came. The tests were run . . . the observers gathered round to examine the still smoking results . . . and guess what?

SyncSort III-and-half won everything! IBM's MVS MF-1 said so. And who are we to argue?

The results are pictured below. Please remember that in a "sorting olympics" the winner always stands on the lowest platform. And that's where SyncSort stood all day while the Whitlow anthem was played again and again.



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Should IBM be discouraged? Not in the least. The difficulty is that the computer giant is competing in the wrong events. Maybe he ought to stick to events where weight and muscle are prime requisites for success. The hardware throw, for example.

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Senate Approves Tax Reform Bill With SSN Clause

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The Senate has approved the Tax Reform Act of 1976 – and with it a provision allowing any state motor vehicle department, taxing authority or public assistance agency to demand an individual's Social Security number (SSN) in the course of administering its programs.

The Senate approved the measure by a vote of 49-42 despite a floor battle fought by senators Charles Percy (R-Ill.) and Barry Goldwater (R-Ariz.).

Differences between the House and Senate versions of the bill will be resolved by a conference committee composed of members of both houses sometime after this week's Republican National Convention.

If the amendment is approved by the conference committee and the bill is passed into law by a vote of both houses, it will wipe out the limitations on the use of the SSN contained in the Privacy Act of 1974 [CW, Aug. 2].

The Senate's approval of the bill marked a victory for Sen. Russell B. Long (D-La.), who told his colleagues that SSNs are needed to prevent "welfare cheating, welfare chiseling, keeping runaway fathers from forever escaping their duty to help support their children and in checking on whether people are entitled to benefits that are available under welfare programs."

Percy, however, argued that existing federal law permits the Parent Locator Service to obtain a missing parent's name, SSN and last known address from the Internal Revenue Service, the Social Security Administration and any state or local government agency believed to have such information.

While Long agreed, he contended "that is not going to do any good unless you can find the number somewhere." If no government agencies are permitted to use it, "where do you have a prospect of finding it?" he asked.

Goldwater argued that full-scale hearings should be held before making changes in existing law concerning use of the SSN.

He argued further that citizens should not have to relinquish their privacy for the sake of a few who evade their responsibilities.

"Right smack dab in the middle of a 1,500-page bill we call a tax bill, we get worried about finding wayward fathers" who total 1.2% to 1.6% of the population with Social Security cards, Goldwater said. "We are sort of killing mice while the elephants are running around stamping things out," he added.

Percy succeeded in getting approval to limit the uses to which the authorized agencies may put the SSN. These include identifying individuals for purposes of the Parent Locator Program and administering their own programs. The authorized agencies would be prevented, for example, from selling lists of names of automobile registrants identified by SSN.

To give the amendment some teeth, the Senate approved language making an individual who illegally uses, discloses or compels disclosure of the SSN guilty of a misdemeanor.

Belle Brings Display of Network to Reduce Floods

(Continued from Page 1)

hurricane barriers that protect the region's exposed south shore harbors.

Last Monday, after a weekend of rain, area streams and rivers were swollen by runoff, but there wasn't much that could be done about it besides warning campers to leave the area and interrogating reporting stations more frequently, Cooper said.

At 8 a.m. that day, dam personnel began calling in alert reports. This is standard procedure as soon as reservoir levels begin to rise or one inch of rain is recorded, he said.

Hydraulic engineers maintained their watch all day Monday and, as the storm approached and rainfall grew heavier in isolated locations, rivers started to fill and dams were slowly shut down.

The hurricane barrier protecting New Bedford, Mass., was closed about 6:30 p.m. and the barrier at Stamford, Conn. was closed three hours later.

Ball Mountain Dam, a 265-foot high barrier on the West River near Jamaica, Vt., which is normally kept at 62.2 feet for recreational purposes, was beginning to fill. This dam protects the cities of Holyoke, Northampton, Springfield and Chicopee, all in Massachusetts, as well as Hartford, Conn.

Two of the dam's three 3-feet by 10-feet wide gates were closed and the third was open three feet.

The computer, which automatically converts water level to water flow, a more telling measurement, indicated 700 cubic feet of water were coursing through the dam every second, according to Bob Mirick, hydraulic engineer.

The 3 a.m. reports on Tuesday showed a little change, and by 6 a.m. water had risen only three more feet, Mirick added.

But two hours later, two more inches of rain had fallen and the water level had risen 13 more feet.

Based on this real-time data as well as analysis of past floods, including travel times of streams into the main river, volume of water and peak rainfall, which the computer converts to runoff, it was decided at 8 a.m. to shut down the remaining gate to one-tenth of one foot, Mirick said.

Reports from other dams along the Connecticut River basin were similar.

While personnel here in Waltham worked around the clock to dam the raging rivers and their tributaries, "throttling down" 12 of the region's 35 dams completely, little rain was falling on the Merrimac River basin less than 100 miles to the east, Cooper said.

Conditions along Vermont's Black River weren't so rosy. There, where no dams have ever been built, flooding was serious. At press time Vermont officials who were assessing damages said they are likely to ask that parts of the state be declared disaster areas so individuals and businesses would be eligible for federal aid.

But flood waters often recede as quickly as they rise, and by 8 a.m. Wednesday the dams were being systematically opened once again.

No Guesswork

Without the transmission network and its automated reporting station, flood control would be a by-guess and by-gosh situation, Cooper indicated.

Each mechanical reporting station contributes to a detailed comprehensive hydrological picture. It reads the environmental variables, converts the data to binary coded decimal signals and feeds that information into the computer, where it is recorded on disk and then retransmitted in teletypewriter code back through the same channels to one of several dams where it can be used for dam operation.

Software, written mostly in Fortran and Assembler language, automatically schedules interrogation in sequence and converts data to engineering information.

Messages printed automatically by an IBM 1132 are flagged with alert signs to warn personnel in advance about possibly hazardous conditions, he said.

Because of the large geographical area from which the environmental data is collected, the central station here does not communicate directly with the remote data stations, Cooper said. Instead, messages are sent via a multichannel microwave radio repeater system and VHF radio intermediate repeater stations.

Satellite May Someday Replace Army's Flood Control System

WALTHAM, Mass. – The radio-based data collection system used by the Army Corps of Engineers in making flood control decisions may someday be replaced by a satellite.

Under a contract with the National Aeronautics and Space Administration, the Corps is testing the feasibility of using the Earth Resources Technology Satellite (Erts) for gathering environmental data from 30 data collection platforms installed throughout New England.

Since 1972 Erts has been relaying river level, precipitation and water quality data from the remote platforms to the Corps' Waltham headquarters in real time. There it is processed by a Data General Corp. Nova 1200 minicomputer.

The satellite, which circles the earth approximately 14 times a day, makes about five "useful passes" – orbits that are high enough to transmit information successfully – Tim Buckelew, a hydraulic engineer said.

The Nova calculates the path of each orbit and feeds that data to a microwave tracking antenna which angles itself for the most accurate tracking.

The satellite picks up signals as it passes over the platforms and transmits them to the receiving antenna here. These signals are fed into a decoder and then to the minicomputer which performs the necessary calculations.

The calculations are then displayed on a Tektronix, Inc. 4014 CRT and stored on disk.

The 30 remote stations identify and transmit a 38-msec message every three minutes to ensure the data is picked up as the satellite passes over the region, he said.

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'Victim' Presses Privacy Laws for Credit Reporters

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – An Atlanta businessman who proved Dun & Bradstreet (D&B) disseminated false information about his companies and won $2.2 million in damages as a result urged that privacy laws be extended to business credit reporting agencies.

Mike Goldgar, who once headed Dejay Stores, a now bankrupt retail clothing chain, and United Star Companies, Inc., an Atlanta-based conglomerate that is also defunct, said businesses should have the same rights as individuals to see and correct their credit files.

Goldgar was one of several "victims" who testified here recently before the Privacy Protection Study Commission on the subject of consumer and business credit reporting practices.

After three days of testimony, two viewpoints emerged: consumer and credit reporting agencies opposed tougher privacy laws while individual victims like Goldgar, James C. Millstone (see accompanying story) and a spokesman for the American Civil Liberties Union supported legislation limiting reports to "relevant" matters and allowing individuals to see reports that will be disseminated about them.

Relevance proved to be an elusive concept, however, with both sides arguing that seemingly irrelevant life-style questions could in fact be relevant.

Goldgar's difficulties apparently began when D&B gave his companies an unfavorable credit rating. He protested, taking his dispute as high as D&B's president.

When Goldgar refused to identify sources of loans, however, D&B employees refused to correct his record. In fact, they set out "to get me" and spread rumors about his finances, Goldgar told the committee.

D&B employees then persuaded three creditors to force Goldgar into bankruptcy, Goldgar said. One was owed $8,000, a second $4,000 and a third $57.

Internal memoranda supporting that conclusion were subsequently produced from D&B's files and introduced as evidence in his case against the firm.

As a result of D&B's action, Goldgar's credit was frozen and bankruptcy resulted.

D&B Data Limited

D&B officials testified that information on the principals of a firm contained in a D&B report is limited. A report contains no references to an individual's personal habits, life-style or personal financial dealings, according to Hamilton B. Mitchell, chairman of the executive committee of Dun and Bradstreet Companies, Inc.

Such information, he said, is limited to the executive's present position; previous business experience; bankruptcies and criminal convictions, if any; education background; year of birth; and marital status, Mitchell said.

Commission Chairman David Linowes disputed this claim, remarking that in his many years in the public accounting business he had seen many D&B reports that referred to the estimated value and condition of an individual's home and his neighborhood, for example.

Mitchell stated further that a major portion of a report is obtained from the business itself, and "any time a company wants to see what we are saying about it, we will give it a copy of its report."

Harold T. Redding, D&B senior vice-president, defended D&B's practice of retaining records of arrests that are not disposed of within six months whether or not an individual is ultimately proved guilty because such charges can have a serious inpact on a business.

Redding denied obtaining arrest information from any sources other than newspapers.

Relevancy of Data On Personal Habits Attacked at Hearings

WASHINGTON, D.C. – Are housekeeping standards, sexual preferences, personal grooming, drinking habits or political, social or religious associations "relevant" and legitimate subjects for consumer credit and insurance investigations and long-term storage in computer data banks?

Many witnesses who testified before the Privacy Protection Study Commission here recently think they are not.

One of them, Jeremiah S. Gutman, chairman of the American Civil Liberties Union's Privacy Committee, granted that if it can be proven statistically that homosexual adults, for example, reduce their life expectancy by patronizing gay bars and "cruising public restrooms," sexual preference could be considered relevant for preinsurance investigation.

He noted, however, that "straight" adults could endanger themselves similarly by cruising dating bars.

In discussing the concept of relevancy as it bears on due process of law, Gutman said information which may serve to demean or deprecate a witness, litigant or accused in the eyes of a judge or jury is excluded from a case unless it can be shown to be relevant to the issues to be decided.

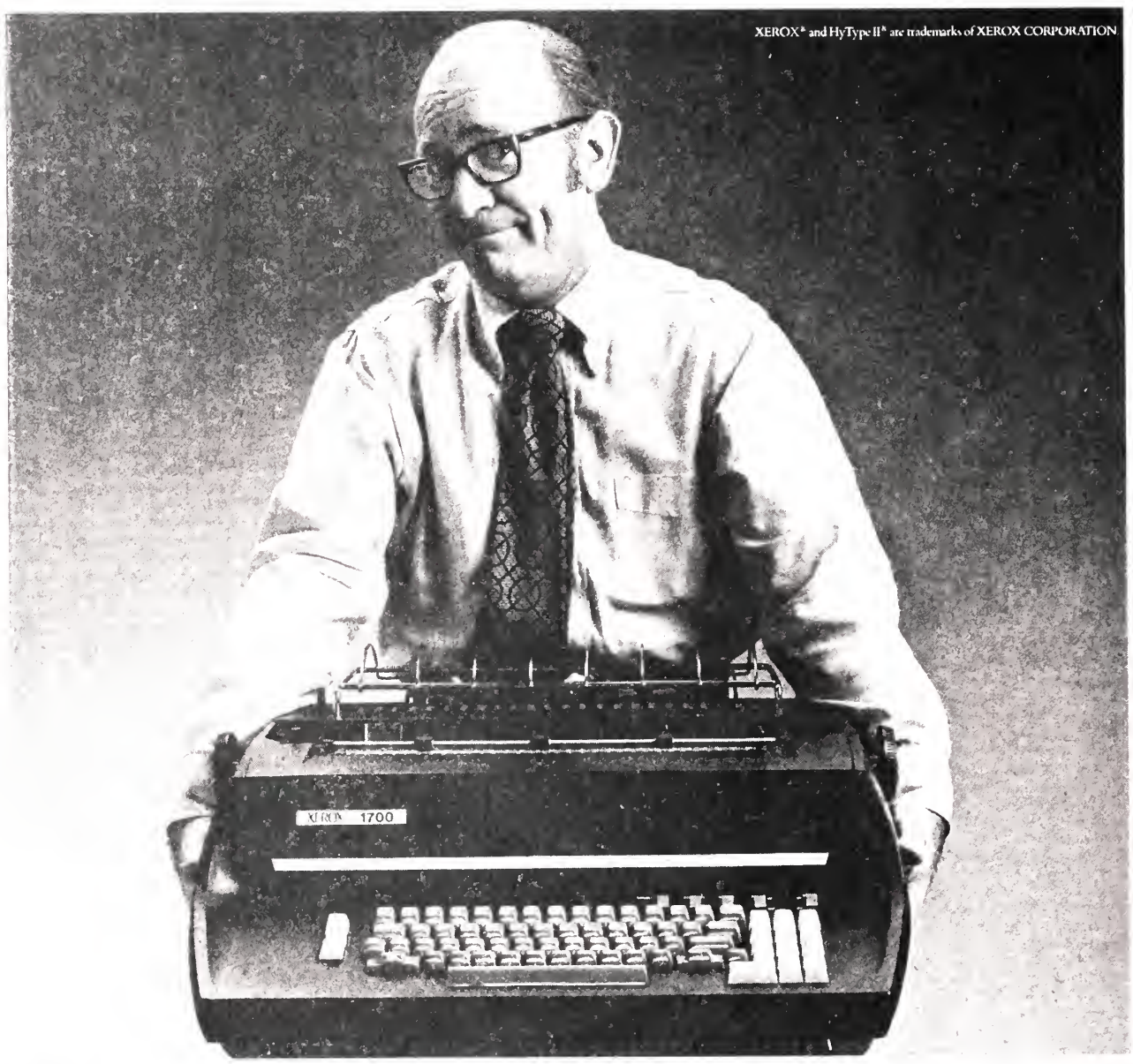
"Thus a prior unsavory career, a lifestyle offensive to the majority, a previous incident similar to the accusation at issue are carefully kept from being contaminant of the impartiality of the finders of fact," he explained.

Much information collected by investigating and reporting agencies for credit grantors, insurance companies and employers is gathered and reported because of "irrational" but "traditional prejudices" of credit grantors, Gutman said.

Gutman urged that the issue of relevancy in credit and insurance reporting be approached by authorizing a specified list of acceptable areas for investigation, recordkeeping and reporting with sanctions against intrusions into areas not specifically permitted.

Since a piece of data becomes decreasingly relevant with the passage of time, Gutman suggested limitations be placed on the time during which arrest records, criminal charges or indictments not resulting in convictions are retained and used in business decisions.

Finally, to avoid imposing a heavy burden of compliance with a variety of federal and privacy state laws on organizations with national scope, Gutman recommended adoption of a single national statute.



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Consumer Finds FCRA Only Good For Those With Time and Money

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – A consumer with patience, money and above-average intelligence can use the remedies provided by the Fair Credit Reporting Act (FCRA) to assert his rights in a credit reporting dispute.

James C. Millstone, assistant manager of the *St. Louis Post Dispatch*, did it – and won $50,000. But it took four years and $4,000 in attorney's fees.

In December 1971, Millstone applied for auto insurance after moving from Washington, D.C., to St. Louis. At that time his insurance broker asked about "any skeletons in his closet," Millstone told Privacy Protection Study Commission hearings here recently on credit reporting practices.

Since he had never been arrested and had no auto accidents or traffic violations, Millstone told his broker there were none.

On Dec. 20, Millston's agent called him to tell him the insurance company had received a negative report on him from O'Hanlon Reports, Inc. Then he remembered problems with a neighbor when he was living in Washington.

Because he had a good relationship with his insurance agent, Millstone got his insurance anyway. It was only when he attempted to learn the contents of the report and find out who else had received it that he ran into trouble.

First, O'Hanlon said it needed the 10 days provided under the FCRA to respond to his disclosure request. Then, nine days later, O'Hanlon's local district manager read him a summary of the report from a single typewritten piece of paper, Millstone said.

This is as much as the FCRA requires.

The report indicated four sources said Millstone was a drug user who had been evicted from three previous residences and had permitted peace demonstrators to sleep on his lawn. In addition his wife's name was recorded incorrectly in the report, he told the commission.

Millstone said he immediately filed a formal complaint with the Federal Trade Commission.

Two weeks later, Millstone received a second disclosure, also read from a single sheet of paper, but no file was provided. The new report indicated the original information had been provided by only one neighbor.

Drug use could not be verified and was therefore deleted, O'Hanlon said.

Millstone still received no assurance he had been told everything in the file nor was he confident others had not obtained it, he said.

Eleven days after the second disclosure, he received a registered letter from O'Hanlon's New York office indicating it had forgotten to tell him his neighbor had also reported that he transported peace demonstrators in his van and that his "undisciplined" children were destroying the neighbors' yards.

This information had been "overlooked" in O'Hanlon's effort to "expedite disclosure," Millstone said.

In April 1972, Millstone filed suit. He was awarded damages of $50,000 in January 1976.

When he finally obtained a copy of the report in the discovery phase of his lawsuit, Millstone learned the negative information had been derived from one nine-sentence paragraph, he said.

Howard A. Slayback, president of O'Hanlon Reports, told the commission such an incident could never occur again, his firm had apologized to Millstone and the case was closed.

EFT to Save $700 Million/Year

(Continued from Page 1)

5.2 billion will be automated," he said, noting that 90% of these will be initiated by either a credit or debit card.

"Cost savings in 1983, due to electronic innovations, are estimated at 14 cents per transaction – a total savings nationwide of $700 million annually," he said.

At the end of 1975, there were over 151,000 electronic point-of-sale (POS) cash registers linked to in-store computers. The total is expected to reach 590,000 by 1980, Alexander said, and many of these POS terminals will be linked to banks' computers in the future.

Consumers today may pay bills more conveniently from their own homes by telephone, have recurring bills deducted automatically from their bank accounts or have their paychecks or Social Security checks directly deposited in banks, he said.

"By 1980, 18 million people are expected to use this service, generating more than 216 million annual deposits electronically," Alexander said.

In 1955, only 100 banks offered credit card plans, Alexander said. Today that number has risen to over 14,000.

The dollar volume for the major bank credit card systems – BankAmericard and Master Charge – totaled $18.3 billion in 1975, more than doubling the 1970 figure of $6.8 million.

"The use of debit cards is another growth area in banking," he said. "These cards can electronically activate cash dispensers and automated tellers and give the customer access to his bank account – in many cases 24 hours a day, seven days a week."

Since 1968, when the first automated cash dispenser was introduced, more than 4,500 automated teller machines (ATMs) and cash dispensers have been installed by 1,300 financial institutions throughout the U.S., and another 4,300 are on order, he said.

"This year, 19% of the commercial banks in the U.S. will be using ATMs, and 93% of a representative sample of marketing executives predict their institutions will have ATMs by 1980," Alexander said.

Fraud Detection System To Save $2 Million/Year

BOSTON – Massachusetts welfare officials here estimated on the basis of initial results that $2 million could be saved annually with a computerized list-matching program to detect fraud.

The Department of Public Welfare (DPW) contracted with Urban Data Processing, Inc. (UDP) to match lists of recipients in one category of assistance with those in other categories four times annually [CW, May 3]. The first run in July turned up 5,632 matches out of the roughly 500,000 names used.

Of those 5,362, 5% will require investigation that may lead to either reduction or elimination of assistance, according to Steve Kane, acting assistant commissioner of DPW. The others are either legitimately receiving more than one type of aid or officials are already aware of the case.

The first run matched names on Aid to Families with Dependent Children (AFDC) with those of the Department of Employment Security (DES), General Relief with DES, AFDC with General Relief and General Relief with Supplemental Security Income.

Matches are made on the basis of name and street address. The system is run on an IBM 370/158.

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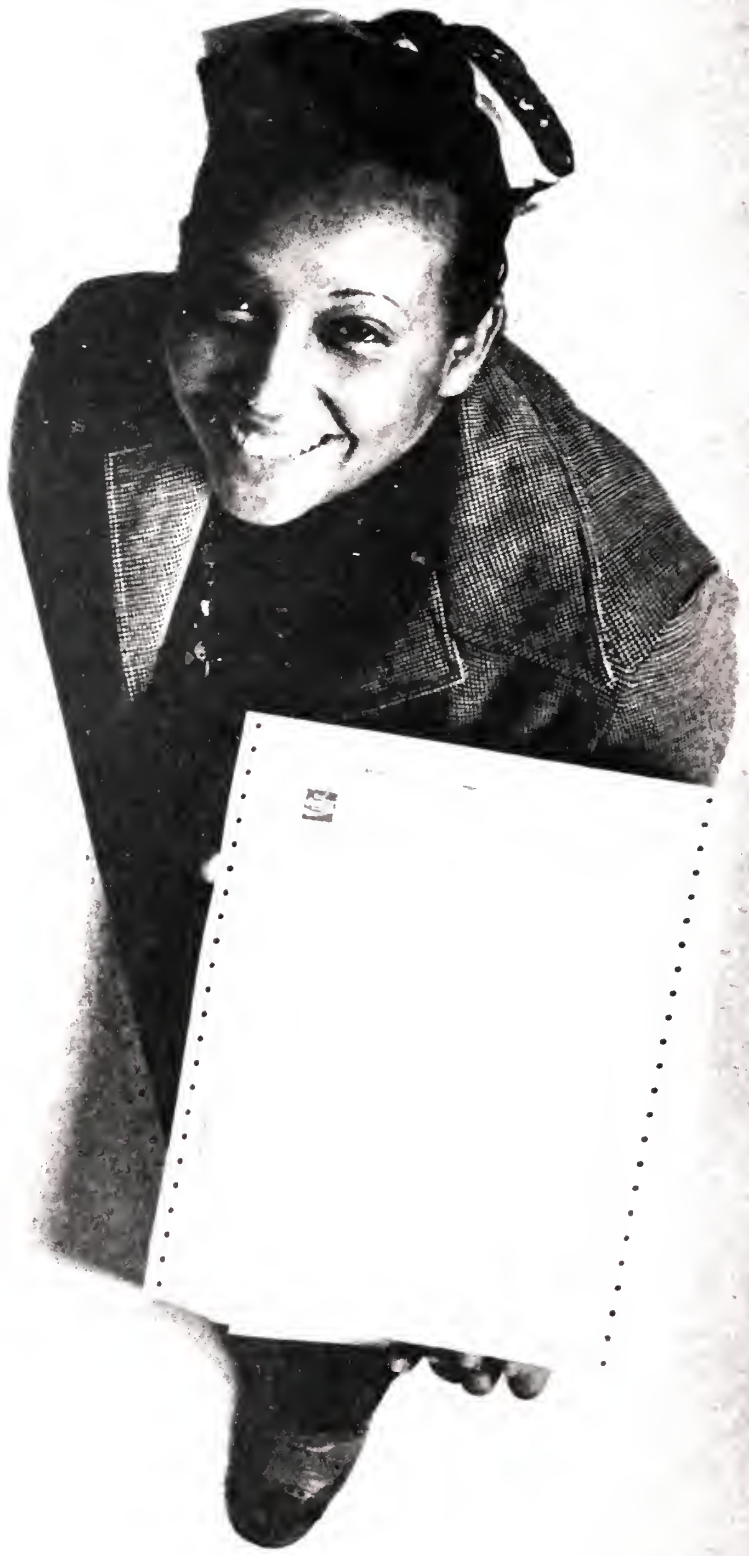

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Epidemiologist Fears Privacy Law Could Halt Research

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Extending the Privacy Act of 1974 into the private sector could seal all civilian health records and halt important research into the causes of disease, according to Dr. Donald S. Fredrickson, director of the National Institutes of Health.

Epidemiologists – doctors who trace the development of diseases by studying medical histories of individuals and specific populations over time – must have access to records of ill as well as "at-risk" populations to continue this vital work, Fredrickson said.

Other health specialists who testified before the Privacy Protection Study Commission here recently emphasized the need for confidentiality of records and supported the rights of patients to control access to medical files.

This is particularly important where health problems bear a stigma, commission members were told. Knowledge of the mere existence of a record detailing treatment for mental health, child abuse tendencies or alcohol or drug abuse could be extremely damaging, according to Dr. Neil Waldrop, deputy administrator of the Alcohol, Drug Abuse and Mental Health Administration.

'Strike a Balance'

"We must strike a balance between personal privacy and the good of society in making personally identifiable medical records available for important research," Fredrickson said.

Dr. E. Cuyler Hammond, vice-president of epidemiology and statistics for the American Cancer Society, emphasized the importance of medical records in cancer research.

Before two major studies were conducted that confirmed the relationship between inhalation of asbestos and mesothelioma, a form of cancer, it was believed asbestos inhalation resulted in cancer of the pancreas – a disease with similar symptons.

Only after researchers studied medical records and tissue specimens from thousands of employees who worked in an asbestos factory during World War II as well as records and tissue specimens of people who lived near the factory at that time was this misunderstanding cleared up, he said.

If a privacy law had required researchers to obtain consent from individuals or their next of kin before records could be obtained, these findings may never have been made, he said.

Veterans records are especially important in research performed by independent epidemiologists because they are relatively uniform compared with data maintained by private doctors, according to Dr. Lawrence B. Hobson, deputy assistant chief of the Veterans Administration's (VA) Medical Division for Research and Development.

The VA's register of 14,000 pairs of twins is very much in demand among medical researchers, he noted.

The Privacy Act, with its consent requirement, will have an important negative affect on epidemiological study now being done with these records in multiple sclerosis, slipped disk and exposure to microwave radiation, he said.

Fredrickson described why medical records are ill-suited to the provisions normally written into privacy laws.

Requiring that all information be collected from a patient is not a particularly good idea since patients often do not given accurate data on themselves; information about life-style and habits provided by friends and relatives is frequently better, he said.

Further, deleting a factual error when correcting a record could destroy vital data. Patterns of incorrect diagnoses often provide valuable clues to the research community, he said.

Most privacy laws advocate access to records by the data subject; in the case of medical records, however, the problem of "adverse effect" to the individual who learns the details of his medical or psychiatric problems was raised.

Those testifying for organizations covered by the Privacy Act of 1974 indicated they handled the problem by reviewing records before the information was provided to the data subject.

If a record is found to contain information that could harm a patient, a qualified doctor is provided to interpret the record or the patient is permitted to have his own personal physician interpret the record for him.

In cases where a minor is the data subject, no consensus was expressed on whether the parent should be granted access to the file.

Spokesmen from organizations that seek to prevent disease rather than treat it also reported special problems to the commission.

Dr. Bruce Dull, assistant director of the Center for Disease Control, said that organization needs access to secondary records – records maintained by laboratories, clinics, state and private health providers, employers, the National Institute for Occupational Safety and Health, the Internal Revenue Service (IRS), the Social Security Administration and even some individuals.

However, since the Privacy Act of 1974 became effective, the IRS will no longer provide individuals' addresses to the center, making location of people with communicable diseases far more costly, he said.

Review and Quality Control

Another facet of the medical record dilemma is associated with review and quality control of treatment.

"With the advent of peer system review organizations, disclosure of medical information to yet another group of non-federal third parties will be necessary," according to Marjorie Lynch, undersecretary of the Department of Health, Education and Welfare.

Testimony from Virgil Slee, president of the Commission on Professional and Hospital Activities, indicated medical records can be abstracted and identified with code numbers rather than names to insure the privacy of health records, without destroying the information needed to judge the quality of treatment.

Lynch recommended the commission take a "functional" rather than an omnibus approach in extending privacy legislation to medical records in the private sector. This would assure the appropriateness of the level of protection afforded to personal information of this type.

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Editorials

FCC Seeks Better Definition . . .

In reopening the Computer Inquiry [CW, Aug. 9], the Federal Communications Commission (FCC) has raised some serious questions about the validity of its approach.

The commission correctly noted that its earlier attempts to define services which were part DP and part communications were less than perfect. These hybrid services had been the cornerstone of the first inquiry decision and basically were designed to regulate those services which are primarily communications in nature.

The premise of leaving DP offerings free from regulation is supported by most industry sources. The problem arises in trying to define how many "incidental" DP features can be introduced with a communications offering.

This problem becomes more acute as AT&T begins to unfold its plans to provide specialized services to DP users. The first of these is undoubtedly the experimental Transaction Network Service in Seattle.

The boundary between communications and data processing is indeed being blurred. But this blur should not provide a facade to allow the carriers to slowly creep into the DP business.

One international expert recently defined a communications service under the proposed new definitions as "a service bureau run by a monopoly." The latest FCC inquiry might unintentionally lead to such a result. This is something the industry should be on the alert to prevent.

. . . But Users' Voices Needed

During the current Computer Inquiry of the Federal Communications Commission (FCC) [CW, Aug. 9], the user must make his voice heard.

Vendors of computers and communications equipment or services will be represented by lengthy briefs and pleadings before the commission.

Each of these special interests will claim to speak for the user and each will say its solution to the problems raised by the inquiry best serves user needs.

The special interests all represent a narrow, profit-motivated industry or industry segment. They will all couch their submissions in language that would make one think they are interested only in the public good and the good of the user. In reality they are all trying to get a bigger share of the computer-communications dollar in their pockets.

Users should not sit by idly. Instead they should write to the commission outlining their needs and views on the entire issue of computer-communications. These do not have to be lengthy, lawyer-written pieces — although users who can afford this type of effort should make it.

Rather, a flood of user letters demanding the commission consider user needs and problems will alert the commissioners that there are more people involved than just the firms in the business.

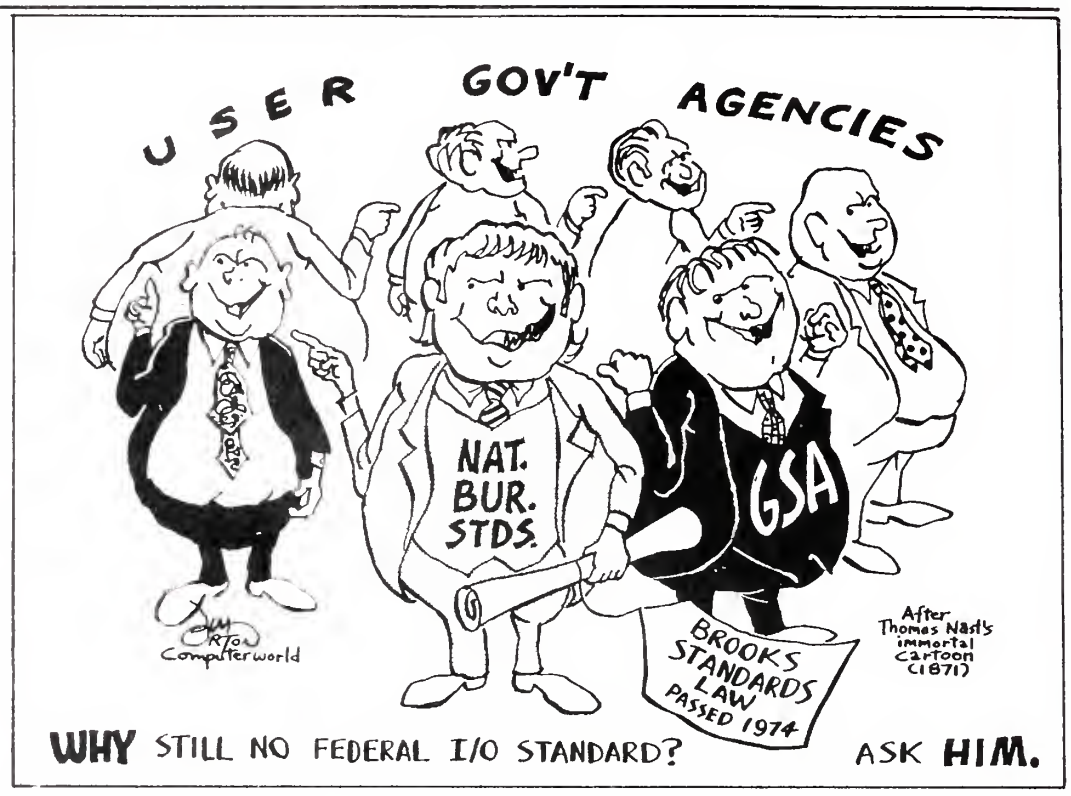
Perhaps the commission then will take the time and effort needed to explore those user problems through questionnaires and opinion surveys.

If users don't speak up, they will have nothing to complain about if their data communications bills get higher and higher. Only through concerted action will they get the message across.

It's up to you. Write today for a copy of the proposed regulations and make your voice heard.

The address is: Federal Communications Commission, 1919 M St., N.W., Washington, D.C. 20554.

Ask for the "proposed amendment to Section 64.702 of the commission's rules and regulations as set forth in Appendix A" and mention the Computer Inquiry.



Letters to the Editor

Lord Takes Name Too Seriously In Blaming Death on DP

Regarding the article by Kenniston W. Lord Jr. [CW, July 26], unless Lord has added a section on Saviorship to the exam for the Certificate in Data Processing (CDP) and passed that section, he is taking his last name too seriously.

Duane Tanner

Salt Lake City, Utah

Reality of DP Responsibility Seen

I've finally read something by Kenniston W. Lord Jr. I can agree with. His article on responsibility for DP-related deaths [CW, July 26] clearly pointed to a reality which may be hard for some of us to live with.

As DP practitioners, our toughest problem is to create systems which fit into a larger moral milieu than efficiency and effectiveness dictate. It started before "Do not fold, spindle or mutilate". It continues with invoices for $0.00. And it won't stop with the deaths of Frank Booth and Steven Karagianis.

Doug Chamberlin

Brighton, Mass.

A Plea for Creative Programming

Regarding Herb Grosch's column [CW, May 24], I have an MS in math and computer science and, after 5-1/2 years at IBM, I decided to try it on my own. My encounters with the "outside world" have not been entirely pleasant and one of the reasons has been the constant battery of tests I must face.

I want to talk of application packages and system philosophy, but instead I get questions testing my knowledge of language syntax and sign-on procedures.

Are there really so many charlatans in the industry that everyone is suspect? I find the insult to my professionalism so unnerving that I often appear less than totally competent.

I turned to computer science from theoretical math because of the joy of building something. The thrill of watching a system grow out of nothing but pencil and paper is unmatched by anything outside of the arts or crafts. Can it be that the creative aspect of computer science is obsolete?

Educators have long noted the inadequacy of testing and grading in teaching our children; hence we have nongraded, free-expression classrooms. They have focused on maintaining a creative environment and fostering independent thinking. Creativity cannot be ascertained in a test.

As Grosch stated in his column, the programmer should sign his work, as an artist or a craftsman.

The second bane of the creative programmer is structured programming. Perhaps the test takers would do well in a structured programming shop. I fully expect to hear in some future job interview: "I'm sorry, but creativity is unstructured; we cannot let you work here."

As I saw standards and restrictions creeping up on me, I escaped to APL, the last refuge of the creative programmer; now there is a book entitled *Structured APL*.

We need to appeal to the end user, the recipient of our efforts, and ask him: "When you buy furniture, would you prefer mass-produced Mediterranean modern or a hand-crafted piece, made with pride, that will last a lifetime and be a joy to use?" Let it be the same with computer systems.

Anita N. Benson
Software Consultant

Greenwich, Conn.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago
Aug. 18, 1971

DETROIT – By restricting memory and peripheral processor components, Burroughs Corp. created two models for its 6700 Series mainframes – the 6711 and 6721. The CPUs only came in 1.5 μsec slow-access core memories, with ranges from 384K to 1,536K bytes.

– – –

WASHINGTON, D.C. – The U.S. Army "lost" 100 trucks valued at $1.5 million because they were omitted or incorrectly listed in its computerized management information system, according to a General Accounting Office (GAO) report. The GAO report declared the Army's system was "unable, with any degree of reliability, to determine its needs for equipment." The trucks were found after being in storage for almost a year.

Eight Years Ago
Aug. 14, 1968

NEW YORK – A short but sweet merger courtship between Western Union (WU) and Computer Sciences Corp. (CSC) was apparently broken up by AT&T when it threatened to suspend negotiations to sell its TWX service to WU.

– – –

CHICAGO – The Data Processing Management Association (DPMA) adopted a multilevel code of ethics for holders of its Certificates in Data Processing (CDP). The ethics code was recommended only for current CDP holders and was backed by the threat of possible removal of the CDP for code violations.

Part of the Solution

There is a well-known recent aphorism whose origin escapes me. It certainly goes back to the Sixties, and it scolds the uncommitted: "If you aren't part of the solution, you're part of the problem!" Now, in many areas of the human enterprise, that's arrant nonsense. Not because every living organism, from a new plant in a Balinese rice paddy to a space shuttle pilot in training, isn't interconnected; we all know that. But because many ferocious problems are so insulated from the efforts of ordinary people that the latter cannot to any measurable degree be "part of the solution."

We see cases where the insulation is distance: the famine-in-Tibet sort of thing. Or ingrained custom: the way universities are organized. Or ignorance, or basic shortages, or a dozen other barriers. In our discipline, the obstruction, at least for several computer generations, has been complexity. It is very hard for most computer people to be much of a part of practical large-scale solutions – and because most of us really desire to improve things, I repeat, it's unfair to say we're part of the problem. We want to do better. But how?

Well, back in the Golden Age, when we were hacking away in the problem thicket with simple hand tools, when we were close to our hardware and understood our software, three major ways of organizing began to function. The first was the technical/professional society: in this country, the Computing Devices Committee of the AIEE, the Electronic Computer Committee of the IRE, the Eastern Association for Computing Machinery, the punched card group in the American Chemical Society, informal subsets of the National Machine Accountants Association and the Systems and Procedures Association. They flourished, as did their foreign counterparts and their later-coming competitors and supplementers.

The second was the User Group, manufacturer-oriented user cooperation. SHARE was first, about seven years behind the ACM sort of thing; now there are dozens, with more starting up every year. In fact, the last two years have seen the hobby enthusiasts calve off microprocessor user groups in rapid succession: another source.

And the third was the standards "movement," the organizing of people and practices to reduce the agonies of interfacing and incompatibility. For computer people, it began to matter at the beginning of the Sixties.

Trouble was, the complexity increased in our trade faster than we could organize to cope with it. When electrical power came in, it spread slowly; interconnections were minor; economics improved over decades, not months as in our fantastic business. Societies and user outfits – yes; the fancy one, the IFIP of that technology, is called CIGRE, the international committee on large power networks – and standards organizations had time to grow up and interact. Not so with us. We did try to federate. There was AFIPS here, regional arrangements, and of course IFIP. And not just the professional societies; there was/is a Joint Users Group, intended at least in part to concatenate user libraries and share horror stories about suppliers. There were federations of standards groups, especially across national boundaries. But to federate is to move slowly, and many of the supergroups acquired a life style and a ladder of executive advancement all their own.

Clearly the time is coming to integrate in another way. Not, I think, to casually discard what we already have, but to link the people underneath these organizations along different, additional channels: orthogonal to what we do now, mathematicians would say.

There were first hints of this back at an early Rand symposium, in 1959. Herb Bright and I drew crazy charts on the chalkboards showing ways of tying together the ACMs and the SHAREs and the standards committees (pre-X3 and -X4). But it was at once too soon – the need was not great enough – and too late – the outfits were already too big and powerful.

A better way is to interlock people themselves, not just paper structures. People are multifunctional; they enjoy switching hats. But an ANSI, a Honeywell User Group, a DPMA finds it hard to do so.

And where do *people* interact? Well, in a word, locally! I would like to see new attempts at local integration: Washington denizens have made some tiny beginnings; Los Angeles is a natural; San Francisco and New York have geographical problems. In a sense, computer people in countries with centralizing capitals (London, Paris, Copenhagen) already do this, and because of the ease of contact work more efficiently than we. But they do not, in London and Paris at least, formally attempt to link their societies, user groups, and standards activities. I believe it can be done, and done quickly, right here. A catalyzing person (a Carl Hammer in Washington, a Jean Sammet in Boston, a Herb Safford in Los Angeles), a couple of organizing meetings, some support money from rich local chapter coffers . . . one success would be enough. Projects are heaped up on every side: advice to local government is an obvious one; performance measurement efforts; consumer interactions. Complexity is our barrier. It is what keeps most of us from being part of the solution. We need simpler ways of working together.

Herb Grosch

Protecting User Rights Makes Systems More Accepted

The Taylor Report
By
Alan Taylor, CDP

Manufacturers Hanover Trust has set up an Automation Steering Committee which monitors the progress of all its projects.

The committee has members from all the right sources (auditing, internal bank operations, international, corporate finance, etc.) at the right level (upper management). It has been organized to have a strictly defined set of responsibilities (approval is needed for projects over $25,000; projects over $150,000 must go to the Senior Priorities Committee), and it is part of a well-thought-out system of controlling project development.

Unfortunately, the system employed by the committee is fundamentally biased against computer users, who are left at the mercy of their more technical colleagues through the use of a series of insidiously worded forms that have no place in a technical establishment.

The forms used include the Project Initiation Form, Work Commencement Notice, Feasibility Acceptance Agreement, System Acceptance Agreement and the Variance Approval Form.

The antiuser bias starts right in the Project Initiation Form. Here, in tiny print at the bottom, the user is told Systems and Planning (SAP) will *automatically and immediately* go on to develop the system after the initial survey (and bill the user department) unless specifically told to cancel the project.

The user is given no time to consider the results of the initial survey report, and these certainly need considering. After all, the documentation is specifically regarded as a contract between the user and DP.

Under the system in the documentation, by the time the user has discovered the anticipated operational costs of the new project (which do not appear on the documentation anywhere), bills can be run up against his department for an unwanted project.

A reasonable system would, at least, give the user some thinking time after the receipt of the initial survey and before any bills could be charged.

Actually, to be evenly balanced, the initial survey results should be binding on the SAP people for about 30 days; and the user would have to explicitly initiate further work. Then, both sides would get their contract rights protected.

Trend Goes Downward

After this inauspicious start, the trend, from a user's point of view, goes downward.

In the Work Commencement Notice, he gets the right to request that the work goes on (which seems to mean anything that the SAP people let it mean – there is no description beyond completion date, estimated costs and system name). SAP is not required to do anything and, certainly, not to stop working if the estimates are not being met. Again, a one-sided system.

However, the Work Commencement Notice is at least addressed to the user. By the time the Feasibility Acceptance Agreement comes around, the user is relegated to being just one of eight approval signatures.

The only term of the agreement is that, based on some time and cost estimates (but no operational specifications apparently), the user is paying all the bills charged, whether or not the estimates are met.

He has no recourse except to fully approve the agreement and the attached proposal. There are no restrictions written into the so-called agreement; there is no way of resolving the inevitable ambiguities of the SAP documents; there is nothing that protects the user's position and nothing that can hurt the SAP area

Acceptance Before Use

The worst area, however, is the so-called System Acceptance Agreement. Factually, this is just another milestone in development when the original programmers are taken 'off the hook' and the maintenance area is put onto it.

Manufacturers Hanover has, for its own reasons, decided to let this changeover occur before the system goes into operation in an environment, other than a testing one. Here the user has to agree to let SAP off the hook on everything (whether the system agrees with the proposal or the specs) before any live use of the system occurs.

This entire system is ridiculous. There are no acceptance tests that can properly protect a user's rights before a system is running.

It is very easy for a user not to know about problem areas for months afterwards and under this system he can only go back to the maintenance and operations people (technical support group and DP department). But under the System Acceptance Agreement their role is strictly limited.

True, they have reviewed the system and have the documentation. But, they have not compared it to the original specifications or seen how it rates in view of the original cost justifications, etc. These essential items are just left floating.

Even the project leader, as he is let off the hook, makes no reference to them, no statement that the system meets specs or anything. The forms designer saw to it he wasn't asked to provide anything except yet another estimate (DP running costs).

'Pass-the-Buck Agreements'

These types of pass-the-buck, boiler-plate agreements are not technically valid. Technically, any agreement between the development group and the user should be based upon either considerable actual experience (as through a complete annual cycle) or upon the accuracy of technical estimates, programming, etc.

A user just isn't in the position to know whether promises are being kept or information is valid until he has used the system and even added to it later.

Asking him – or rather requiring him – to give up his rights to internal boiler-plate contracts may be administratively effective, but is technically improper.

I hope Manufacturers Hanover will review and change its policies soon so they don't work just because the users are a captive market, and don't rock the boat.

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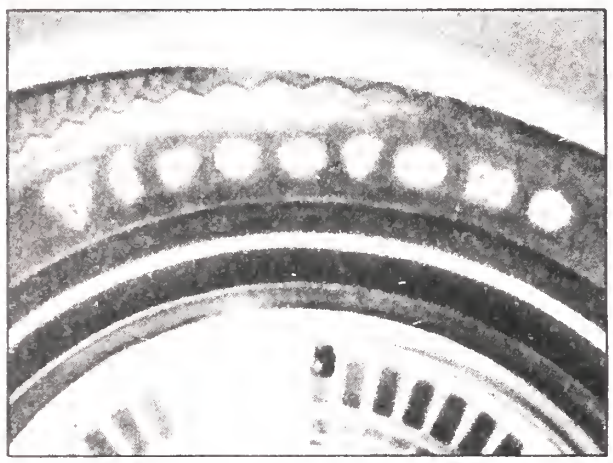

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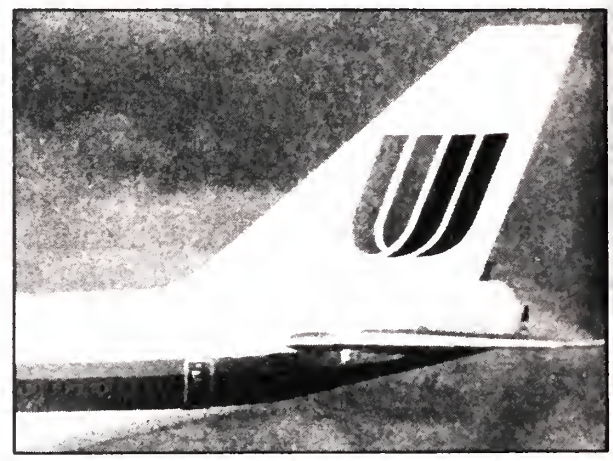

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When It Comes to Manuals

Too Many Examples Better Than Not Enough for User

By Joseph T. Rigo
Special to Computerworld

Everyone knows examples are important in user manuals for a computer system or software package.

Everyone knows, so everyone includes them. Or at least they try.

For example . . .

Way back in the dim mists of ancient history, I was the tech writer maintaining the Fortran IV and Basic Fortran language manuals for IBM's 360. My job was to write new material for the manuals, correct errors and draft answers to comments from customers.

The Fortran manuals were widely used, so we got a lot of comments, but a couple of sections of the manual escaped serious criticism. One of these quiet spots was a five-page example at the back of the Fortran IV book.

The purpose of this example was to show what a complete program might look like with all the statements in their proper place. The person who originally wrote the book was a math major, and he chose a complex math operation as a basis for the example.

The example showed two or three pages of math notation followed by equivalent Fortran code. The math portion was filled with superscripts, subscripts, sigmas and other symbols to delight the eye. We never paid much attention to it.

One day we received a 200-page reader comment from something called The Polyquestion Society. The society turned out to be a student group at what was then the Brooklyn Polytechnic Institute. It had carried out a project to find at least one error on every page of the IBM Fortran manual.

Some of the society's discoveries were good. Others were pretty far fetched. But it really had a field day on the math example.

In those primitive days the basic text was on tape, but the superscripts, sigmas and other symbols had to be hand-pasted onto the camera-ready copy. This job had to be repeated every time we revised the manual, and we were constantly leaving out symbols or putting them in the wrong place.

The point is that no one noticed. No one complained, because no one ever used the example. Even the Polyquestion people were looking for something other than an understanding of Fortran.

The example was too big, too complicated and too specialized. It was easier for a user to go down the street to buy one of Dan McCracken's books about Fortran programming than to wade through the thing.

I would like to be able to say that we replaced it immediately with a couple of smaller, more useful examples. But change takes time at IBM. The last time I looked, it was still there.

Many vendors make the mistake of pinning all their hopes on a single big example. They use one or two illustrations to demonstrate every bell and whistle in their system. Each example becomes hopelessly confused and complex.

It is all right in a classroom situation to cram everything into a single example. The instructor keeps attention focused on a single element at a time.

But the user of a reference manual is confronted with the whole mess. He must spend time finding the part that applies to his immediate problem. He may even have to go to other parts of the manual just to get background information about the example.

This is irritating to the best of users. It is even worse to someone who is in the middle of a problem at a terminal whose meter is running.

Reader Commentary

The real need is for lots of examples at all levels. One way to look at this requirement is to compare it to the problems of a programmer who is working on code to edit input.

First, the program must examine each parameter, key word or data field as an individual entity. Then the program must check on the field's use within the card. Next, it examines the field's consistency with entries in other cards. And so on.

Similarly, a manual may need an example of each parameter. It need not be much; a single word or line may do. But it should appear on the spot with the basic explanation of the parameter, not at the end of the chapter.

The immediate example helps the new user enormously. It also aids the experienced user who is checking up on a small but important point.

Another set of examples is necessary at

(Continued on Page 16)

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'Good Guys' Finally Won One

Rochette Case Harbinger of DP's Future

By Kenniston W. Lord Jr.
Special to Computerworld

For Eugene Rochette, a "computer error" and all its attendant problems now means he has been bankrupted into wealth.

But it wasn't always that way. Back in 1974, Rochette's business was forced into bankruptcy by a pattern of "computer error" on the part of France's second largest bank, the state-owned Credit Lyonnais.

Rochette, a fruits and vegetable wholesaler in St. Alban du Rhone, a suburb of Grenoble, France, had paid his suppliers with checks totaling $25,500. The bank proceeded to return the checks, marked "insufficient funds."

As a result, Rochette's suppliers refused to sell to him and he was immediately blacklisted by them. Rochette then lost his largest customers, primarily supermarkets, since he could not supply them.

And all the while, there were more than sufficient funds to cover the checks he had drawn. The declaration of bankruptcy came later that year in the Commercial Tribunal of Vienne, near Grenoble.

But right is right, and no "computer error" would stop Rochette, who immediately set about to sue Credit Lyonnais for its misdeeds. Last September, the Commercial Tribunal found in Rochette's favor and ordered Credit Lyonnais to pay $149,000 in damages. The bank proceeded to appeal and the appeals court nearly doubled the award to $290,000 in July [CW, Aug. 2].

In traditional fashion, Reuters news agency attributed the foul-up to "computer error," totally ignoring the fact that "computer error" is really a misnomer for "people error," for Rochette most certainly must have tried to get people to do something about the problem.

Still, it seems, the problem persisted, and Credit Lyonnais is now left to lick its wounds, having paid out nearly 12 times the amount of funds originally in dispute. Clearly, to Credit Lyonnais, the ability to feign anonymity behind the computer can no longer be valid.

Precedent Set

More importantly, however, is the fact that an important international precedent was set in that French court. For the first time, a consumer disadvantaged in a major way by a computer-based company won a major anticomputer battle.

One can only wonder what the implications can be for American business and American consumers.

This country has long been overdue for consumers to stand up and be counted regarding the callousness extended by those firms which use the computer as the excuse for poor personal service. Where we do hear of a major suit, such as Smith vs. J.C. Penny, how is it that we never hear of the adjudication?

Could it be that the case, like so many others, has been quietly settled out of court? Could it be that the consumer advocates of this country have been happy merely to handle individual cases on a one-by-one basis with little reporting of the entire pattern of consumer-computer abuse?

Where are Common Cause or Nader's Raiders when it comes to things like this? Could it be that adept and polished public relations people are quietly keeping the whole thing on the hush while incident after incident is "handled"?

How is it that the populace is willing to stand by while one firm after another collects data about it, fends off complaints with smooth talk and uses the data in a policy untouched by existing regulation? The answer – at least the only *apparent* answer – seems to lie in the fact that no single individual has been so seriously disadvantaged to make an issue of it.

Further, it has not become important enough as yet for any organized DP "professional" society to do its part to educate the populace to the point that it knows what specific requests to make and what specific actions to take.

...And in This Corner

It is, after all, unlikely that those who would benefit most from the shield provided by the "computer mystique" would take steps to see that shield removed.

As pointed out in a recent *Infosystems* editorial, the pattern of legal action is increasing, not decreasing. On the heels of the initial IBM vs. Catamore decision [CW, July 9, 1975], firms are now finding courts will favor the specific performance offers of hardware and software vendors.

A recent issue of that magazine devoted its cover story to DP malpractice, giving credence to this author's predictions in 1973. At the moment, such malpractice seems to have settled at the organizational level. But having done that, can it be long before it settles at the personal level?

So the time seems right to make another prediction: The time is coming when a firm will be forced to conduct business, even credit business with its eligible clientele, while at the same time being legally enjoined from using the computer to support that business.

When that occurs, the difficulties anticipated vis-a-vis privacy concerns will seem miniscule in comparison, for a highly automated firm may well be required to operate dual systems to conduct its business.

At the same time, there will be a movement to assign personal responsibility for computerized actions and frustration.

As long as firms are permitted to construct and use computer systems with no expressed guarantees to the persons they purport to serve, as long as firms are permitted to construct and use systems with no mandatory design standards employed or enforced, as long as firms are able to treat their customers with impunity through the thin veil of "computer error," the situation may well continue and may well be excused at the insistence of well-meaning consumer advocates.

But there seems to be ample evidence that the veil is fast disappearing as people come to understand their rights and the fact that their real adversary is not the computer itself, but rather the people who use the computer.

Eugene Rochette was able to turn his misfortune into fortune solely because he had the courage to counterattack. Such counterattacks may soon catch on and go beyond the destruction of the payment card as American consumers read of Rochette and others who are sure to follow.

Yes, the "good guys" finally won one, but at the same time we should begin to recognize that what we have seen is merely the harbinger.

Where's Solution?

There's the problem; what's the solution? The solution, it seems to me, lies not in maintaining the status quo, but instead undertaking a major overhaul of our thinking, of the traditional policies, practices and toothless "standards" – voluntary, of course – which have advanced us to where we are now.

The solution lies in an industrywide statement of acceptable practices, adopted as legal-based systems construction and audit criteria.

Who is going to do it? It seems that none of the so-called "professional societies" are about to do it. It's certain that the American National Standards Institute and the American Federation of Information Processing Societies will not do it. It's certainly not in their best interest to do so.

But there is indication that such a codification of practices may well come out of efforts at the Institute for Certification of Computer Professionals (ICCP), efforts growing out of both the licensing upheaval and the recognition that one cannot apply standards of performance measurement against people until standards of performance are determined for the tasks they must perform. That effort has only been three years in the formulation, merely one-eighth of our computer history.

Organizations, however, have a functional upper limit. Most are so concerned about their politics and proliferation that their forward progress is measured in inches, not in feet.

The next action, it seems, must be taken by individuals assigned to their organizations – individuals who recognize that the "chickens are on their way home to roost," and soon, and who recognize that if their functional organizations do not take action, then legislators will.

For Eugene Rochette, who today counts in feet and not in inches, a major victory has been won, and that is good. But for you and me, while the end may not be in sight, clearly the direction has been established.

Now what are you going to do about it?

Manuals Lack Needed Examples

(Continued from Page 15)

the card level. The manual might show one card with all possible fields filled in. Another example could show a more realistic situation where, often, some fields might not be used.

The third level might combine different cards related to a single user function. For example, most report program generators or report writers permit a user to make calculations during processing. They have one type of card to specify the calculation; another defines new data fields or variables to hold the results of the calculation.

Vendor manuals commonly show the cards separately. The cards do not appear as a functional unit until the big example at the back of the book, where they get lost in the mass of complexity.

Finally, there is the big example everyone loves. In fact, hopefully there are several.

The big examples illustrate the capabilities of the system and varying user applications. Again, they should be simple to the extreme. A point is being illustrated, and it should not be buried in the implementation.

In reality, it is difficult to include too many examples at any level. The worst error is to try to get off easy by forcing one example to do more work than it can handle.

Remember, the Polyquestion Society may be watching.

Rigo is president of Sysdoc, Inc., a New York-based documentation consulting group.

Achieves 'Modest Degree of Success'

Firm Aims Course at Smoothing User-Analyst Relation

By Don Leavitt
Of the CW Staff

ALEXANDRIA, Va. – While there is general agreement that improvement in user-analyst relations is needed and some disagreement on how to bring about that improvement, Mobil Oil Corp.'s International Division has had "a modest degree of success" with a two-day "Project Management for Users" course, according to E.V. Halpern.

Speaking at a recent symposium here on "The Systems Analyst in Perspective," the director of Mobil International's training effort said his program has two prime objectives. One is to suggest a means of overcoming the user's start-up inertia; the other is to open a dialogue between user and analyst.

In the first instance, the user needs to be shown how to get involved. In the second instance, the user gets the message to "make sure the analyst knows what he is doing," Halpern said.

The presentation is made more meaningful, he continued, by having analyst personnel present and participating and by using an audiovisual course titled "Users Guide to Data Processing Management" prepared by the Data Processing Education Network.

In his training, the user is shown that the extent of his involvement varies from one phase of a project to another, but that initiation is where he is most involved and where his contribution is "both important and necessary. He must play an active role if the project is to succeed," the Mobil spokesman noted.

Within the course, the initiation phase starts with an idea on the part of the user. But Mobil shows him the need for a checklist that asks questions about the number of records, the means of recording and filing data, record activity and time constraints.

As both the capabilities and the limitations of the DP equipment are brought out, the checklist is expanded and tradeoffs are gradually recognized by the user.

The end of the feasibility study is another go/no-go checkpoint for the system. If both the user and the analyst have done their jobs properly, the user should be beginning to understand how decisions governing projects are made "and this is really the goal of the user involvement process," Halpern added.

Peopleware

At this point, Mobil's instructors suggest the user prepare a project proposal. The request should describe the old system if there was one, state the problem and tell how the new system will operate. It should finish with a statement of costs and benefits as they are defined at this preliminary stage, he said.

This can be a "very useful communications tool" even at this early stage, Halpern said, noting the user can do an adequate job only if he fully understands his desires.

User involvement of this nature "will have the effect of slowing down the initial phases" of system development.

But "if we spend more on the 'front end,' we should be able to recover these costs by savings on the 'back end,'" he added.

'Refs' Provides Security for IMS Sites

WAYNE, Pa. – The Remote Entry Flexible Security (Refs) package is a data security system which can be used by any application requiring controlled access to specific IMS transactions, according to its vendor, Suntech Computer Services.

Designed for use with IBM 370s under IMS/VS version 1.0.1 and up, Refs is said to provide more control, flexibility and efficiency and require less overhead than IMS by itself.

The added control is available through the limited transaction list available to each user, Suntech said. On the other hand, flexibility is enhanced since entrance to the system can be from any registered IBM 3270 CRT terminal, the firm noted.

Aids Terminal Efficiency

IMS-supplied terminal and password security features can be used in conjunction with Refs, but the Suntech software permits more efficient use of the terminal, a spokesman continued. Unlike the IBM password facility, Refs requires the user to enter his unique identification code only once, he added.

While a traveling operator gains the flexibility of being able to perform work from any terminal or location, the operator/user who opens a terminal through the sign-on procedure is responsible for activity at that terminal.

When leaving the terminal, therefore, the operator must sign off to prevent unauthorized use of the device and of the transactions available to the operator, the spokesman noted.

Transactions may be added or deleted from an operator's authorized list at any time after approval of the appropriate installation management. Actual maintenance of the security data base is handled on-line.

Written in Cobol, Refs imposes several restrictions on its users. All security displays, for example, are designed for the 3270 Model 2 large-screen CRT, and data base DBGENs specify 3330 disk packs as the storage medium for all security files.

Refs source code is available for $1,500 from Suntech at Suite 350, 7 Executive Mall, 680 E. Swedesford Road, Wayne, Pa. 19087.

Tracks on CPE, Engineering Slated for Eurocomp

LONDON – Computer performance evaluation (CPE) and software systems engineering will be the subjects of two separate but related conferences that make up the European Computing Congress (Eurocomp) to be held at the Heathrow Hotel here next month.

About 70 papers will be presented in the sessions scheduled for Sept. 14-16. Together they will present "a comprehensive appraisal of current thinking, research, planning and experience in these two areas," according to the sponsoring organization, Online Conferences Ltd.

Although speakers will come from all across Europe as well as the U.S., all presentations will be made in English, Online noted.

Kiviat to Speak

The CPE portion of the program will be chaired by Philip Kiviat, technical director of the U.S. government's Federal Computer Performance Evaluation and Simulation Center (Fedsim). The software engineering sessions will be led by Prof. Brian Randell of Newcastle University.

CPE session topics will cover performance management, network performance, system measurement both in theory and in case studies and simulation of computer systems. Workload definition, modeling and approaches to systems evaluation will also be considered, Kiviat said.

The engineering sessions will cover new approaches to system structuring, design tools and techniques, languages and operating systems. Software management, systems reliability and testing and validation will be covered in other sessions, Randell noted.

The registration fee for Eurocomp, which covers attendance at any of the sessions in either subject area, lunches and receptions, is approximately $250. Further information is available from Online Conferences, Cleveland Road, Uxbridge, Middlesex, England.

G&W Designs Basic System for GA Minicomputer

CORAL GABLES, Fla. – A business-oriented Basic compiler and data management system has been developed for the General Automation, Inc. (GA) SPC-16 minicomputer by Geigel and Williams Systems, Inc. (G&W).

The package supports all Basic indirect commands defined by the American National Standards Institute draft standard, the vendor claimed.

G&W Basic runs under standard GA operating systems with supplementary – optional – modules for simulating channel programs and providing dynamic terminal and disk buffering. These modules provide rapid response and high throughput in a swapping environment, a G&W spokesman added.

As implemented by G&W, Basic supports sequential, relative record and Isam files for both private and "public" use as well as interactive file creation, according to the spokesman.

Protection and synchronization primitives in the form of logical reserve, enqueue and dequeue operators are also part of the language, he noted.

Application programs from G&W were designed to access integrated data bases on an interactive, multiterminal Basic. Currently in the library are accounts receivable, accounts payable, general ledger and payroll as well as order entry, inventory control, purchasing and shipping and receiving control routines, the company said.

The package can support four terminals on a 32K-word SPC-16 with a fixed-head disk without response time degradation or thrashing, the spokesman added.

Licenses for the G&W Basic, data management system and application library are available for $2,000 from the firm at 1301 Campo Sano, Coral Gables, Fla. 33146.

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'EMS' Service Aids Planners

NORWALK, Conn. – The Economic Modeling System (EMS), now on the National CSS, Inc. (NCSS) network, enables users to build and then work with complex data bases of their business operations; to analyze trends and patterns; and to forecast elements such as sales, expenses and profits, the vendor said.

With EMS, a user can perform all the tasks associated with business modeling and forecasting, NCSS claimed. Support is available for data organization, documentation and storage; data manipulation and transformation; equation estimation; model construction and simulation; and display, a spokesman added.

Data management facilities within EMS handle time series data. They feature automatic dating of observations and conversion of different frequencies to a user-defined standard, he said.

EMS capabilities include leads, lags, conventional algebraic and logical operators. Regression equation estimation capabilities include the use of algebraic transformation within the regression equations, according to NCSS.

All capabilities are executed with English commands, and the number of commands needed to accomplish a task has been reduced through the use of options within commands, he said.

Within EMS, each time series may be accompanied with descriptive text. Every aspect of a user's work (data, equations, parameters, models, forecasts, etc.) may be individually documented.

The NCSS network can be accessed from major cities in the U.S. and Europe. The firm is headquartered at 542 Westport Ave., Norwalk, Conn. 06851.

Debugger Manages Data Checks In IBM 360/370 Environment

ROCKVILLE, Md. – The PRI Debugger from Program Resources, Inc. (PRI) is a program test aid used to bypass some types of program errors in an IBM 360/370 environment in order to provide the user with a more comprehensive test run, according to a spokesman.

Written in BAL, the debugger is called by a source program written in BAL, Cobol, Fortran or PL/I. It becomes part of the object program: one statement is added to each program and a data definition card is used for selective dumps and diagnostic statements, he said.

With the test support code in place, the user gains automatic correction of data exceptions, with reexecution of the originally unacceptable instruction, or display of specific diagnostics where a logical program error is detected.

While there are a number of packages already on the market that cope with data exceptions in test runs, PRI claimed its diagnostic messages separate its debugger from all the rest. The thousands of operating system messages are reduced to 400, "accounting for most commonly encountered program errors," according to PRI.

Once an error is detected, the relative and physical addresses are noted, a narrative explanation of the error is documented and the probable cause is noted, the spokesman said.

The data exception handling is allowed only as long as certain predefined thresholds are not exceeded, the spokesman added, noting that without such control a test run could continue to unusable extremes.

Requiring only 2K bytes of storage, the PRI package is available in object code for a single installation for $300. Source code and license for unlimited usage costs $2,000, the spokesman noted from Suite N 1009, 12000 Old Georgetown Road, Rockville, Md. 20852.

Floppy DOS, Basic Available for 8080

MOUNTAIN VIEW, Calif. – A floppy disk-based DOS and an extended Basic language facility are available for use with the Intel 8080 microprocessor in a software package from Intelligent Computer Systems (ICS).

The DOS manages system resources and supports as many as eight disk drives and four open files in concurrent use. Sequential and random access methods are both provided, as is an assembler, in addition to a debugging package for assembly programs and a text editor, ICS said.

The Basic software includes both a "compiler" that generates intermediate code and an interpreter that uses the code to execute the programs.

Language features included far exceed the minimal Basic specifications currently under American National Standards Institute (Ansi) study, the firm said.

Instructions are included that permit users to use DOS capabilities directly, rather than through separately coded Assembly routines.

The DOS-Basic combination package requires "no more than 16K bytes of memory and one floppy disk" and is available under license for $500.

A package supporting teletypewriter/CRT asynchronous low-speed communications with an IBM 360/370 is also available for $500, the company said from Suite 40, 777 Middlefield Road, Mountain View, Calif. 94043.

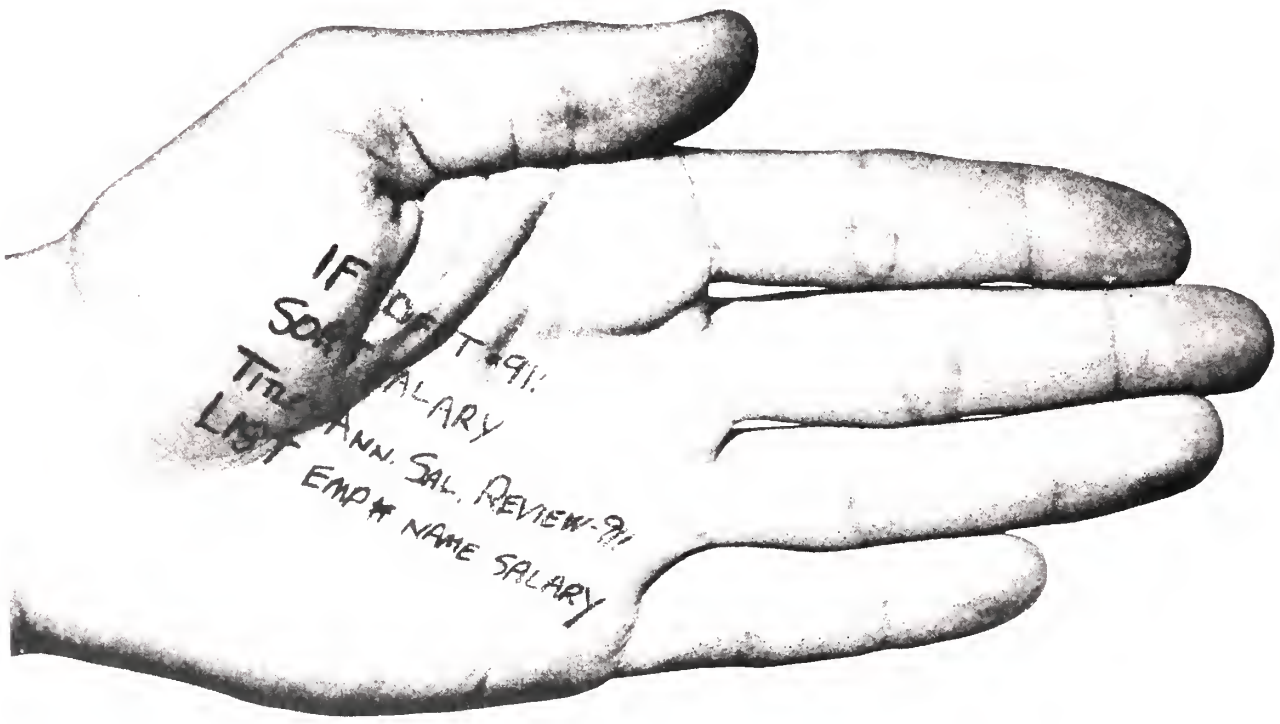
'Dapl' on RCC Network Backs Microprogramming

LOS ANGELES – A general-purpose microprogramming language called Dapl is now accessible via Remote Computing Corp.'s (RCC) nationwide toll-free network.

The product currently supports Advanced Micro Devices' AMD2900 and Fairchild Semiconductor's 9400, and will soon support Motorola Inc.'s 10800 and Monolithic Memories, Inc.'s MMI 6700, the company said.

Dapl allows the microprogrammer to select any of four levels to provide a symbolic representation of his microprograms. Macros and symbolic values are allowed at all levels and Dapl allows microprograms from 8K words by 256 bits.

RCC is at Suite 1400, One Wilshire Building, Los Angeles, Calif. 90017.



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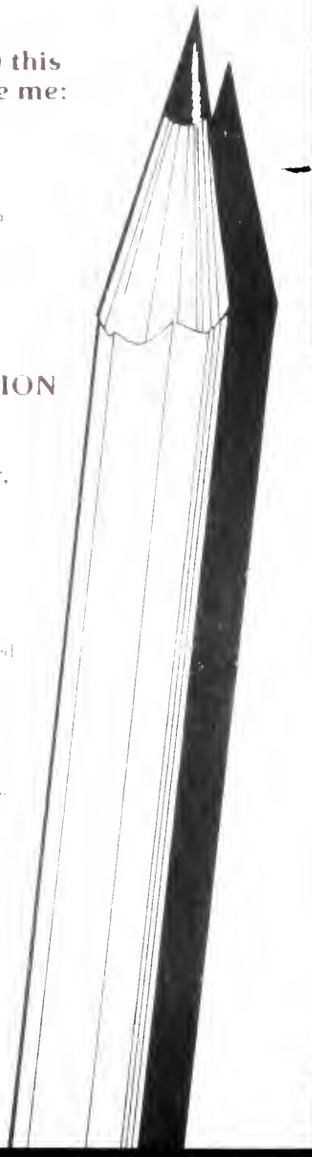

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Cullinane Information System — 1:00-3:00 p.m.

An introduction to the direction the Cullinane Corporation is taking in providing their clients with a complete information system. Cullinane developments include a Data Dictionary, The SHADOW II Communications Monitor, On-Line Query System, Distributed Data Processing and Mini-Computer versions of IDMS. Also covered will be the CULPRIT Retrieval System and user department versions such as EDP-AUDITOR and EEO-AFFIRMATIVE ACTION REPORTER.

Social — 3:00-4:00 p.m.

Opportunity to discuss specific questions in depth with members of the Cullinane Corporation Technical and Management Staffs in a relaxed and casual environment.

Seminar Leaders

Robert J. Davis — Mr. Davis is Regional Marketing Manager for Database Systems. He has extensive experience with most aspects of database system design and usage, and has held key positions with both IBM and CINCOM. He is responsible for the marketing of database products in the U.S. and Canada, analyzing competitive products, and finding new markets for database technology. Mr. Davis holds a B.S. degree from the University of Akron.

William E. Linn — Dr. Linn is a member of the Cullinane Corporation Senior Technical Staff. His responsibilities include IDMS training, database consulting and technical marketing support. He was previously with Southern Railway System in Atlanta where he was deeply involved with database administration activities with IDMS. He has his Ph.D. in Computer Science from the University of Michigan and has been associated with the Georgia Institute of Technology teaching data structures and list processing techniques.

Raymond J. Nawara — Mr. Nawara is Southwest/Plains Area Manager of Cullinane Corporation. He has had extensive experience with the design of health and patient-care systems. Previously he was the Data Base Administrator at the Health and Hospitals Governing Commission of Cook County, Illinois where he had extensive experience using IMS. He has consulted in Database Applications for a variety of clients. Mr. Nawara is a graduate of the University of Houston with a major in Mathematics and Computer Sciences.

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Utility Eases OS, VS Chores

COLUMBIA, S.C. — The Multi-Function Data Set Utility Language (MFDSUL) was designed to provide IBM OS and OS/VS programmers with a simple means of writing customized data management and utility programs, according to the vendor, Diversifiedata Services.

The variation of DP tasks that can be done with MFDSUL "is left to the users' skills and needs," a spokesman noted. Common tasks are data selection, test data generation, report writing, file modification and correction and record display, he added.

The package's facilities can also be used for file-to-file conversions, "unit record functions" and logical data manipulation, he said. MFDSUL includes a vocabulary of 25 mnemonic instructions and functions as an "assemble-and-go" operation, the vendor explained.

MFDSUL supports as many as two input and four output data sets and two print files. All standard devices types are supported and data set organization may be sequential, indexed sequential, Vsam or partitioned, the spokesman added.

The package includes an "automatic read" option which generates appropriately timed reading instructions without user coding; this would be used most often for simple tasks, the company said.

A user-controlled exit facility which allows the use of routines written in Assembler, Cobol or Fortran permits the use of logic beyond the limits of the MFDSUL instruction set.

MFDSUL requires 36K bytes of main memory and is available for $2,650, Diversifiedata said from Suite 406, 240 Stoneridge Road, Columbia, S.C. 29210.

Goal-Directed Coding Approach Illustrated by 'Silly Program'

By Richard J. Cichelli
And Martha J. Cichelli
Special to Computerworld

Concepts and Techniques

Goal-directed programming (GDP) [CW, Aug. 2] is most easily illustrated by an example. Edsgar Dijkstra posed the following programming problem:

You are given two subroutines — READCH, which reads a single character, and WRITECH, which writes a single character. Given an input sentence, write a copy of it such that (1) extra blanks are eliminated and (2) every other word is written backward. The input sentence:

this is a silly program.

would be written:

this si a yllis program.

(Because of this example sentence, the program became known as "The Silly Program." See "Notes on Structured Programming" in *Structured Programming* by Dahl, Dijkstra and Hoare.)

To simplify the program, sentences are defined as being one or more words, each word separated by one or more blanks. Sentences end with a period, and the maximum word length is 20 characters.

The solution to this problem will be presented in Scobol (an extended form of Cobol developed by Lars Mossberg of Volvo Flygmotor and implemented with a precompiler).

In our earlier article, we wrote a program to copy a sentence:

```
REPEAT
   CALL 'READCH' USING CHAR.
   CALL 'WRITECH' USING CHAR.
UNTIL (CHAR = PERIOD).
```

In the second version of our program, the new goal is to eliminate extra blanks.

The final article in this series will show how GDP techniques can be applied to debugging and documentation, how they apply to large systems and what tools are available to make GDP easier.

To do this we must ignore any blanks which precede the first word, extra blanks between words must also be discarded.

Note that we cannot write a blank immediatley after copying a word; we must first find the next nonblank eharaeter because we do not want to write a blank before the period ending the sentence.

```
NOTE-GOAL=SKIP LEADING BLANKS.
REPEAT
  CALL 'READCH' USING CHAR.
UNTIL (CHAR NOT = SPACE)
NOTE-GOAL=COPY REST OF SENTENCE.
REPEAT
  copy rest of sentence
UNTIL (CHAR = PERIOD)
```

The goal "copy rest of sentence" ean be decomposed into the three subgoals, "copy a word," "get the next nonblank character" and "write either a period or a blank after the word." This portion of the program is expanded:

```
NOTE - GOAL = COPY REST OF
SENTENCE.
REPEAT
  NOTE - GOAL = COPY A WORD.
  REPEAT
    CALL 'WRITECH' USING CHAR.
    CALL 'READCH' USING CHAR.
  UNTIL ((CHAR = SPACE) OR
  (CHAR = PERIOD))
  NOTE - GOAL = GET NEXT
  NON-BLANK CHARACTER.
  WHILE (CHAR = SPACE) DO
    CALL 'READCH' USING CHAR.
  ENDDO.

  NOTE - GOAL = WRITE PERIOD
  OR BLANK
  IF (CHAR = PERIOD) THEN
    CALL 'WRITECH' USING PERIOD.
  OR
    CALL 'WRITECH USING SPACE-CHAR.
  ENDIF

UNTIL (CHAR = PERIOD)
```

REPEAT and UNTIL are Scobol keywords which implement one of the D-structures (Dijkstra) for eonditional repetition. Since the termination test is at the end of the sequence, the block of code will execute one or more times.

The WHILE-DO-ENDDO Seobol construct implements a repetition with a test at the start of the code sequences; the code will be executed zero or more times.

The IF-THEN-OR-ENDIF implements a completely nestable if-then-else; the keyword OR replaces ELSE to permit standard Cobol if-then-elses as well.

The last refinement of our sample program will be to write alternate words backward. If words are to be written backward, they must be saved as they are read. Forward words will be read and written; backward words will be read, saved and then written.

(Continued on Page 22)

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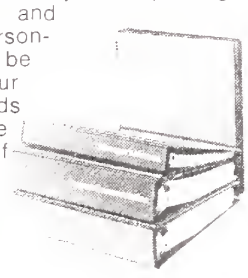

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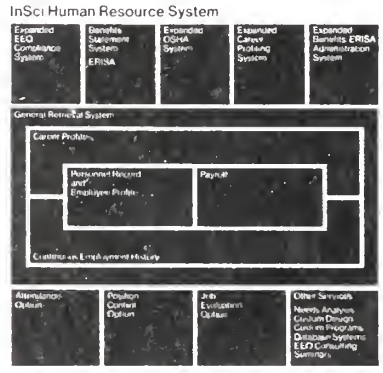

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Serious Problems Overlooked

Upgrade From IBM 3 to 370 Not as Easy as Claimed

By Frank Nestor
Special to Computerworld

The article headlined 'Upgrade from IBM 3 to 370 Called Easy' [CW, July 12] made interesting reading, but I suspect the upgrade was not as easy as represented. The speaker apparently failed to mention several possible problem areas.

RGP-II on the IBM 3, for example, allows an unordered load for an indexed file with just the index in a certain order and the file in a different sequence. A 370 does not, and any system using this will have to be rewritten.

What about Assembler on the 3? All DS and DC instructions work from right to left on it, but from left to right on a 370.

Nothing was mentioned about sorts. The 3's $DSORT allows add-out sorts, summary sorts with just needed fields output and tag-along sorts with or without the control fields output.

The 370 does not and, in addition, 3770 sort does not have card input unless an assembler exit program is written for it. Multiple input files cannot be sorted and merged, but must be in the correct sequence in order to be merged.

In IBM 3 $DSORT, up to eight input files can be sorted and merged; these can be mixed input, all in one pass. As most installations use a great number of sorts, a major revamping may be required to overcome this difference.

Another area where a 370 differs from a 3 is in utilities. There is no comparable utility in 370 for the $COPY of the 3. If one needs file-to-file copies on disk or tape, for example, 360 utilities must be obtained and modified for 3340 disks. The available utilities supplied will copy file-to-file, but only in the same location on the receiving pack.

The 3's $MAINT handles all library functions for all the libraries, but 370 library functions require separate utilities for each library and another for reorganizing.

What about teleprocessing? Many IBM 3 users, especially 3/15 users, are running CCP or RJE. Nearly all these users have their programs written in RPG-II.

The 370's Btam, MICS or CICS do not support RPG-II as a teleprocessing language. All teleprocessing applications written in RPG-II would have to be rewritten in Cobol or Assembler depending on which method of teleprocessing was selected on the 370.

What about conversion costs? An article, "Converting? Think Twice" in the July 1976 issue of *System/3 World*, covers this area very well.

In addition, nothing was said about the additional people who will be needed, to function as systems programmers.

There may be no great program changes necessary, but there may be a need for extreme system changes. In the words of that famous master of probability, Mr. Murphy, "Nothing is as easy as it looks."

Nestor, a former systems programmer at a 370 installation, is now employed as a systems analyst in a large 3/15 shop.

Use of Goal Shown By 'Silly Program'

(Continued from Page 20)

The words which are to be written backward will be saved in a 20-element table of characters. A variable WORD-LENGTH will be used to indicate the growing number of characters in te table, and a logical variable or "switch," FORWARD, will indicate whether the word is to be written forward or backward.

The "copy a word" routine is now replaced by:

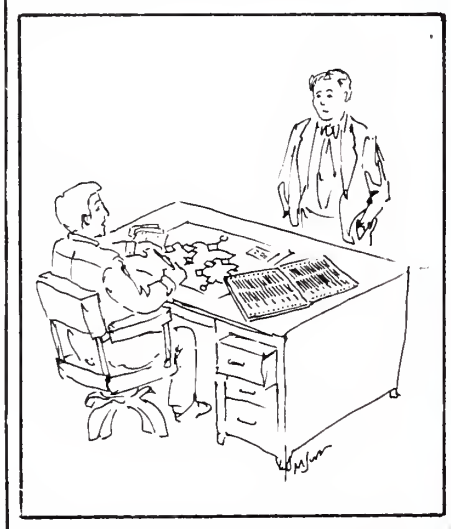
```
NOTE - GOAL = COPY A WORD.
NOTE - FORWARD CASE FIRST.
IF (FORWARD = TRUE) - THEN
  REPEAT
    CALL 'WRITECH' USING CHAR.
    CALL 'READCH' USING CHAR.
  UNTIL ((CHAR = SPACE) OR
  (CHAR = PERIOD))
OR
NOTE - AND NOW THE
BACKWARD CASE.
  NOTE - GOAL = SAVE
  CHARACTERS IN WORD.
  MOVE ZERO TO WORD-LENGTH.
  REPEAT
    ADD 1 to WORD-LENGTH.
    MOVE CHAR TO WORD (WORD-
    LENGTH).
    CALL 'READCH' USING CHAR.
  UNTIL ((CHAR = SPACE) OR
  (CHAR = PERIOD))
  NOTE - GOAL = WRITE IT
  BACKWARD.
  REPEAT
    CALL 'WRITECH' USING WORD
    (WORD-LENGTH).
    SUBTRACT 1 FROM WORD-LENGTH.
  UNTIL (WORD-LENGTH = ZERO)
ENDIF
```

Richard Cichelli is research manager of computer applications at American Newspaper Publishers Association/Research Institute in Easton, Pa.; Martha Cichelli is a partner in Software Consulting Services, Allentown, Pa.

DASD Ups Package Price

MILWAUKEE – The cost of the RPG II to ANS Cobol conversion package from DASD Corp. [CW, Feb. 19, 1975] will increase from $8,400 to $11,500 on Aug. 23.

DASD is at Suite No. 6, 8707 N. Port Washington Road, Milwaukee, Wis. 53217.



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With 'Total Solution' Service

Network Users Seen Free of Application Dependency

By Ronald A. Frank
Of the CW Staff

TORONTO – U.S. data communications users would like to eliminate the application dependency of their networks so they can have more flexibility – and they will achieve this with future "total solution" service offerings, according to AT&T's David O'Dwyer.

Each application now typically has its own network; these networks tend to be private line-centered with a limited area of interest, O'Dwyer told a session on network planning at the recent International Conference on Computer Communication (ICCC) here.

Users would like to more easily change or expand their nets with "durable systems standards" without completely replacing their installed components or revising their programs and procedures, O'Dwyer said.

The absence of a "total data communications system supplier" has forced users to design, develop, integrate, maintain and operate their own networks. Implementation of these nets has been complex, costly and concentrated with the large user; the needs of the small user have been only "minimally addressed," he said.

These opinions were based on a phone survey of data users conducted recently by AT&T and were meant to express the user's viewpoint, he added.

Over the next 10 years, five trends will evolve in data communications, he predicted. They are:

- More CPUs will be equipped with communications and, as a result, data communications will grow at a faster rate than data processing.
- Data communications functions will be distributed from the host to other system components such as remote control units.
- Dedicated (single-application) nets will merge into shared systems, reducing duplication and costs. This will allow smaller users to participate.
- Transaction-oriented, message-oriented and batch-oriented applications will appear as a "traffic continuum" to the network and the user will be able to "schedule traffic" in a more efficient manner than is possible today.
- Decreasing microprocessor costs will lead to multifunction devices such as data sets integrated into terminals and control units; multiplexers integrated into front ends and control units; and credit/debit terminals integrated into higher function point-of-sale terminals.

Users want to achieve greater network flexibility without replacing terminals now in use and "without substantial changes to existing programs and procedures," O'Dwyer said.

Installed terminal devices, "if supported properly," could remain functional indefinitely, he told the session. In addition, users will satisfy their requirements by utilizing digital and satellite communications.

The user's ability to implement communications functions into data networks "will be further enhanced by the emergence of system architectures," he forecast. These will set standards for system performance and optimization and, in some cases, will be integrated with the DP function.

When this happens, he said, some "component suppliers will find it increasingly difficult to participate" because of requirements for both hardware and software compatibility and support.

A data communications offering that addresses user requirements could provide a total solution to these problems, he said.

CW At ICCC

Future of Packet-Switched Nets Remains Clouded

By Ronald A. Frank
Of the CW Staff

TORONTO – The Third International Conference on Computer Communication (ICCC) held here recently featured on-line demonstrations of five packet-switched networks.

France had three nets – RCP, Transpac and Cyclade. Canada showed Datapac, and Telenet represented the U.S.

Despite the apparent high visibility of these networks, however, only Telenet is an operating public network accessible to commercial users. Datapac will follow in a few months when it begins to connect users.

Beyond this, public availability of packet-switched data communications networks remains shrouded in a cloak of standards and political questions.

Most of the networks still support asynchronous terminals and – except for some research environments – the much heralded full-duplex synchronous transmission protocols remain untested.

Despite adoption of the X-25 network protocol by the Consultative Committee on International Telephone and Telegraph and its implementation by most nets, the problem of user synchronous terminal access remains unsettled.

Major terminal suppliers are all developing network architectures to tie users to their respective DP equipment. The willingness to interface these architectures to the packet-switched nets will be determined by vendor marketing decisions and carrier politics.

Analysis

But the carriers appear reluctant to give too many packet network control functions to their prospective customers. The real reason for X-25 with its virtual circuit approach may be related to this question: an alternative to the virtual circuit is the datagram, which is used internally for network transmission by almost all the packet carriers.

For U.S. users, the packet plans of AT&T may represent an opportunity for the easy interfacing of most terminals to what eventually will be a global packet network. AT&T plans a packet net in 1978 which reportedly will bring it into direct conflict with IBM's terminal/network strategy.

Most network users hesitate to make expensive system decisions until more answers are available. In the meantime, the packet-switching technology which originated in the experimental U.S. Arpa network waits for a full-fledged testing from the promised real world of the commercial public packet nets.

Standards Development Stressed

TORONTO – The importance of developing common standards for the emerging data communications networks was a strongly stressed theme at the recent International Conference on Computer Communication here.

Dr. E. Hummel, senior counsellor of the Consultative Committee on International Telephone and Telegraph (CCITT), said the X-25 protocol recommendation being implemented on several packet-switched networks is a good example of international standards cooperation.

The X-25 recommendation will come before the full CCITT this fall and, if it is approved, it will be possible for a data user to connect with the same technical and procedural standard to any packet-switched network, Hummel said.

The proposed standard unifies network access for intelligent terminals and forms the basis for intelligent signaling procedures which Hummel described as the next urgent step in international standards efforts.

After that, a network access procedure for nonintelligent terminals will have to be developed, he said.

A further development will be the establishment of rules for interworking circuit-switched and packet-switched networks. This step finally will provide full interconnection of all data networks and result in a general worldwide data transmission network and service, Hummel said.

Standards now being adopted by the public packet-switched networks should also be utilized by private nets, according to Phil Kelly, head of data planning for the British Post Office.

If this happens, users of private nets would be able to go to public nets for backup facilities in much the same way private line users now go to dial-up lines when their primary systems malfunction.

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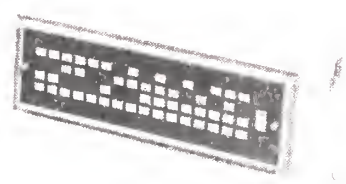

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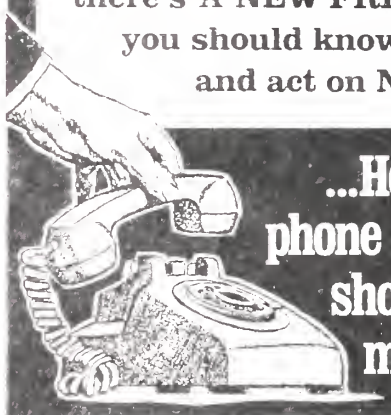

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Links to Installed CPUs

Wavetech Adds Audio Response System

SAN DIEGO — Wavetek Data Communications has expanded its audio response product line with the ADC-1500 audio response system.

The ADC-1500 was designed as a supplemental system for all mainframe and minicomputer users who desire to expand their computer capabilities to include audio response, Wavetek said.

It can communicate with any host device having 1,200 bit/sec asynchronous protocol capability over either full- or half-duplex lines. The interface to a host device is accomplished through a standard RS-232C connection, the company noted.

Remote operation between the audio system and the host can be accomplished using 202C- or 202D-type modems over voice-grade telephone lines, it said.

Data input to the unit is made by multifrequency tones at 10 char./sec with an initial capability of two to 32 I/O lines, Wavetek added.

The unit can transmit data at .5-sec intervals or at transmission speeds of 110-, 150- or 300 bit/sec. The system is also said to have remote diagnostic capability.

The audio response unit is compatible with transaction telephones, Bell System Touch-Tone telephones, Plantronics Corp. VU Set CRT terminals and Wavetek numeric terminals, the company added.

Prices for the basic ADC-1500 start at $25,000 with delivery in 120 days, the firm said from P.O. Box 651, San Diego, Calif. 92112.

Paradyne Line Sharing Device Provides 19.2 kBit/Sec Operation

LARGO, Fla. — The Paradyne Corp. Line-Sharing Device (LSD) is a data transmitter/receiver which is said to provide full-duplex data communications at speeds from 9,600 bit/sec to 19.2 kbit/sec over unconditioned voice-grade channels.

The LSD utilizes two independent voice-band channels operating at speeds of up to 9,600 bit/sec, the company said.

Standard features of the device include built-in diagnostics and an unattended self-monitoring capability that automatically switches down the speeds of the associated modems whenever channel degradation threatens data transmission capability, it noted.

System backup is provided via dial backup over each of the voice-grade lines, Paradyne added.

In addition, the unit has a "line-voting" capability which is said to allow simultaneous 9,600 bit/sec transmission over two different circuits and then automatically select the best circuit as the transmission route.

Built-in diagnostics of the LSD provide for network fault isolation and correction. Using an integrated test pattern generator and error detection, the device can insert a sequence in place of normal terminal data and monitor it, Paradyne said.

A network can be placed in either remote or local loopback from a single LSD, which allows the system to be tested from either end, it added.

The LSD is priced at $5,150 or $235/mo on a two-year lease and $165/mo on a three-year lease, the company said from 8550 Ulmerton Road, Largo, Fla. 33540.

Dynatech Switch Changes Modems

ALEXANDRIA, Va. — Dynatech Laboratories, Inc. has added a modem substitution switch system to its line of communications control equipment.

The switcher allows an operator at a remote location to substitute a spare modem for any one of up to 64 on-line modems by pressing a button, the company said.

An interlock feature to prevent accidental switching is incorporated in the system, as is an LED display to show system status, a spokesman added.

The system is comprised of two elements, a control panel and the switcher. Each control panel handles up to eight switchers and each switcher handles eight on-line modems plus one spare modem, the company said.

Capacity can reportedly be extended from a basic eight-modem system and one spare to a 64-modem, eight-spare system. In addition, modem speeds may be intermixed in groups of eight, it added.

The price of a basic substitution switch for eight modems and the spare is $1,550; the control panel ranges in price from $525 to $700 depending on the number of switches, according to the spokesman.

The company is located at 900 Slaters Lane, Alexandria, Va. 22134.

Tele-Dynamics Limited-Range Unit Works With Unloaded Private Lines

FORT WASHINGTON, Pa. — Tele-Dynamics has a limited-distance modem which reportedly permits error-free communications over unloaded private cable systems or telephone company-supplied local exchange loops.

The Model 7300 provides full- or half-duplex operation over four-wire lines or simplex operation over two-wire lines, at 1,800-, 2,400-, 3,600-, 4,800- and 9,600 bit/sec and 14.4- and 19.2 kbit/sec speeds, the company said.

A phase-delay system of data encoding is featured by the device, which generates a narrower transmitted spectrum than other two-level techniques resulting in lower transmission frequencies and allowing higher transmit levels, according to the company.

A compromise transversal equalizer offsets transmission effects of the cable and further extends the range for private line metallic circuits; at an 1,800 bit/sec data rate, a range of 100,000 feet was obtained, Tele-Dynamics said.

The Model 7300 modem sells for $695, with quantity discounts available, Tele-Dynamics said from 525 Virginia Drive, Fort Washington, Pa. 19034.

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On-Line Units Speed Austrian Insurance Services

GRAZ, Austria – The installation of on-line terminals has reportedly enabled an Austrian province to expedite health insurance services to 750,000 of its residents.

In common with most European countries, Austria has a comprehensive system of social security which embraces the whole range of health insurance, retirement pensions and unemployment compensation.

The Steiermarkische Gebietskrankenkasse (STMK GKK), headquarted here in Graz, capital of the province of Styria, is a regional health organization which has been a leader in adopting the most efficient administrative methods, a STMK GKK spokesman said.

Also located here is the largest hospital in the province, Landeskrankenhaus, with a 4,000-bed capacity. Elsewhere in Styria are 18 other hospitals with a total of 13,000 beds.

The STMK GKK plan covers most of Styria's workers and their dependents, pensioners and the war injured. Insurance plans operated by other organizations cover the remaining half of the province's population.

In 1973, the STMK GKK acquired a Univac solid-state computer which was used to keep records of the contributions paid into the health plan by employers on behalf of their workers. The use of this computer resulted in a reduction of 43 people in the clerical staff, the spokesman noted.

Dr. Hans Dobida, head of the DP department for the STMK GKK, said the experience in effecting economies with this computer led the staff to investigate further possibilities of becoming more efficient.

"We were not only looking for economies in operating costs, but also to give much better service to the persons insured by our organization," Dobida noted.

Under the old system, the insured person brought a certificate from his physician or employer stating he was unable to work to the regional office. The clerk in the office completed this certificate, which was then sent through the post office to the headquarters here, Dobida explained.

Because the capacity and capabilities of the computer were not enough to handle the new concept, it was obvious a larger system capable of real-time operation was required, Dobida said.

A larger Univac 1106 CPU capable of real-time operation was installed in the STMK GKK DP center here in April 1972. Since the transfer of the batch operating programs to the 1106, the earlier computer is no longer used.

The 1106 system has a main memory of 262,000 words. The peripheral equipment includes six magnetic tape units, six magnetic disk units, two high-speed memory drums, a high-speed printer and two Univac 9200 computers for I/O operations with the larger unit.

The DP center is operated by a staff of 45 persons consisting of computer and keypunch operators, programmers and systems analysts working under the direction of Manfred Strohmayer, the DP manager.

Previously, information on insurance payments by employers was sent by the companies through the post office to STMK GKK, where it was punched on cards and entered into the system. Today, this information is entered into the system via Uniscope 100 display terminals in real-time mode, Strohmayer said.

The central government's Department of Social Administration in Vienna keeps a data bank with records of health insurances administered by all of the provinces so that pensions can be calculated and various statistics prepared.

Previously, the records from STMK GKK were sent to Vienna on a magnetic tape. The system has been improved to allow the information to be transmitted directly to the department's computer via a data communications line from Graz.

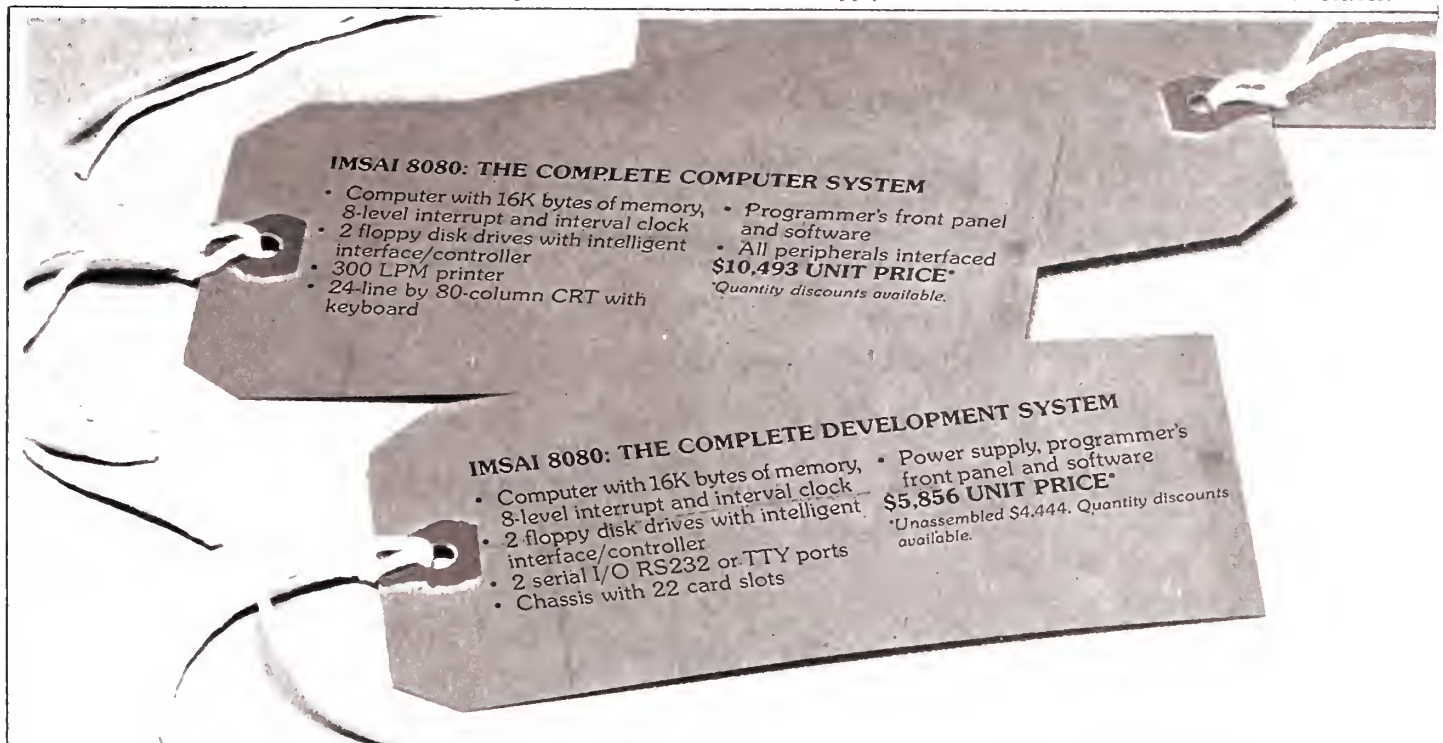
Terminal Transactions

Twenty-five terminals in various administrative offices in the headquarters here are connected on-line to the 1106 system. Several of these terminals are installed at the counters where the insured apply for benefits.

The clerk at the counter, using a visual display, calls up the person's records in the computer files and receives a response on the screen of the device within two to three seconds.

Four other terminals with printers attached are installed in other offices in the headquarters to obtain information as required from the CPU.

A further enlargement of the real-time system occurred in 1975 when the computer communications network was extended to 20 branch offices.



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Bits & Pieces

NBS Publishes Guidelines For OCR Forms Designers

WASHINGTON, D.C. – The National Bureau of Standards (NBS) has issued new guidelines for optical character recognition (OCR) forms.

Federal Information Processing Standards (Fips) PUB 40 describes OCR requirements for forms and presents suggestions for efficient and economical form design.

The publication inclues a checklist for forms definition, design, verification and specification, as well as a description of forms layout papers, rules and representative reflective inks, NBS said.

Fips PUB 40 is priced at $1.80 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Printers Work With Minis, CRTs

COSTA MESA, Calif. – Tokyo Juki Industrial Co. has introduced the 5700 series of dot matrix serial printers.

The double-head Model 5703 prints 75 line/min at 132 char./line, while the single-head Model 5701 prints 50 line/min.

The printers were designed to interface with minicomputers, CRTs and data communication terminals.

The Model 7503 is priced at $2,400 and the 7501 at $1,900 from the firm at 3186-G Airway Ave., Costa Mesa, Calif. 92626.

BST Disk Drive Fits IBM 3/10

SANTA ANA, Calif. – Business Systems Technology, Inc. (BST) has introduced a plug-compatible disk storage drive for IBM 3/10 computers.

The BST/458, a single-disk drive, is expandable to four drives and adds 20.4M-bytes of "removable" disk storage to the 3/10, according to the firm.

Average access time for the BST/458 is said to be 35 msec, with a data transfer rate of 312 kbyte/sec.

BST is offering the unit on a month-to-month, one-, two- or three-year lease or for purchase. The BST/458 costs $600/mo on the month-to-month lease.

BST is at 3015 Daimler St., Santa Ana, Calif. 92705.

Adage Cuts GP/400 Prices

BOSTON – Adage, Inc. has announced price reductions for the GP/400 graphics peripheral product line.

The average price reduction for a typical GP/400 three-dimensional configuration is 10% to 15%, Adage said.

Further information is available from the firm at 1079 Commonwealth Ave., Boston, Mass. 02215.

Because 3350s Not Available

User Puts STC Super Disks on 360/65

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – "IBM has left its 360 and 370 users to sputter along when it comes to disks; it wouldn't do anything to give the 3350 to 360 users," according to Lee Johnson, president of Computer Network Corp. (Comnet).

The national service bureau's reaction to the neglect it felt it was suffering at the hands of IBM was to install Storage Technology Corp.'s (STC) Super Disks – the first Super Disk installation on a 370/65.

"While this had never been done before, it's a very efficient method," Johnson said.

The first STC 8000 control unit and STC 8800 disk drive were installed at Comnet last October and a second disk was installed in February.

Comnet had been using IBM 3300 disk drives and wanted the Super Disks to augment its storage. It now has 7G bytes of storage; another 6G bytes are on order.

The company was "not at all hesitant about being the first user to implement the disks on a 360/65," Johnson said. "We've been doing business with STC since 1971 and have always been satisfied with it."

Although STC said the Super Disk's access time is 30 msec, Comnet found the use of monitoring devices reduced it to between 21- and 23 msec, Johnson said. The company makes approximately 500,000 inquiries hourly, he added.

There were no installation problems, according to Johnson. STC engineers worked with Comnet throughout the implementation to smooth out any problems that might have occurred, but there were "absolutely none."

Although some of Comnet's marketing people were nervous about the move to Super Disks, the company put its heaviest workload on them "from Day One," Johnson said, so it would know how the disks would hold up under the toughest of conditions.

The two disks run 720 hours per month each, and they have been operating for 10,180 hours with only one failure, Johnson said.

That failure occurred in March when an idler bearing started slipping, it took 13 minutes for STC to fix the problem, he said.

The only complaint Johnson had with the Super Disks at first is that they are covered with metal so there are no visual indications of drive activity, as there are on the IBM 3300.

STC corrected this problem by installing light display consoles on the drives to show which of the logical spindles is being addressed and how often, he said.

Fish Processor Finds Microfilm Saves File Space, Access Time

GLOUCESTER, Mass. By converting its accounting and inventory files to microfilm, a processor of frozen fish products here said it reduced file space by 80% and cut retrieval time from an average of four minutes to less than a minute.

The company "had nearly a million documents in the paper files consisting of accounts payable and receivable invoices, check duplicates, inventory transaction documents, purchase orders and requisitions," according to Robert E. Jennings, systems controller of the Gorton Group.

"And," he added, "we were adding about half a million documents a year to the files."

A Kodak Miracode II microfilmer was installed to permit insertion of a machine-readable binary code between film images to identify each document. When a code is keyed in on the controller of the Miracode II retrieval terminal, the terminal locates the desired document image and displays it on the screen.

One adaptation of the filing system was made to cross-index the credit and invoice files. "With the paper files, if we had a pricing error on an invoice and a credit was issued, someone would pull the invoice and note on it the credit and the number of the credit slip," Jennings said.

"You can't write on microfilm, however, so we added another three digits to the coding of the credit files to cross-index the invoice the credit was issued against. Now, if we need to know that a credit was issued, we can use the retrieval terminal to search the film, locate it and reference the incoice," he explained.

Before switching the company's files to microfilm, Jennings spent a year conducting a study to make sure the conversion would work. One aspect the study focused on was filming efficiency.

The coding is entered by the operator through a controller similar to a 10-key calculator pad at the time documents are filmed. On most paperwork, the coding information was located in several places on the document, forcing the operator to scan the entire sheet while coding.

Coding is now all in one place "speeding operations considerably," Jennings said.

During the year-long conversion study, interviews were conducted with everyone who used the paper files to get their suggestions and make them feel a part of the new system.

The origional plan called for file clerks to train others to use the retrieval terminal, but people started using the microfilm files immediately, Jennings said.

By using the terminal in a "walk up" environment, retrieval time for each record has been trimmed to about 30 seconds, he added.

In the Used Market – Part 3

Three Avenues Open to Sellers

By Sonny Monosson
Special to Computerworld

Having made a decision to offer his used equipment for sale, the user has essentially three avenues open to him:

- To establish dealer contacts.
- To establish one or more brokerage contacts.
- To attempt direct sale of the equipment himself.

As a market developed for used computers, capital became increasingly available for dealers, whose numbers have grown rapidly over the past five years. The used computer dealer purchases equipment for his own inventory or account.

A dealer's business activity is keyed to the margional differences between prices at which he may sell equipment and his cost of acquisition, as well as the length of time in inventory. His operating expenses are mainly involved with keeping goods in inventory for resale purposes.

The great advantage to the seller of used equipment is the dealer's commitment to pay for this equipment on delivery – albeit at what is otherwise referred to as "wholesale" prices. The dealer, as any buyer, must be notified of exact details of the equipment offered for sale – equipment model and type, options, features and description, for example.

These details are frequently supplied by a photocopy of original purchase invoice and invoices for maintenance services. Additional information concerning the configuration and its history are also pertinent to the transaction. The invoice

(Continued on Page 28)

Winner in 1976

The new Vistar/3 is a micro programmable terminal with even more features than other Vistar models. Editing, formating, reverse video, blink capability, cursor sense, polling... you name it and this winner has it. And at the same low price as the Vistar/2.

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Three Alternatives Open to Sellers of Used Systems

(Continued from Page 27)

itself is often helpful for descriptive purposes.

Once the seller and the buyer have come to a general agreement to purchase, the dealer is normally prepared to work out the details of title transfer with the seller. Should the user encounter a general resistence to buy on the part of known dealers, he may take this as a mild warning that the market for his machine is presently sluggish.

The Broker Commitment

Having approached the dealers or bypassed them entirely, the seller may contact any number of groups operating as computer equipment brokers. The broker works for a fee, payable generally by the seller and agreed upon in advance of any marketing activity.

The fees requested generally bear some relation to the anticipated effort required to place equipment with an end user. The role of the broker is to attempt to identify prospective purchasers and to assist in negotiating final terms.

Brokers' fees are currently quite variable, ranging from 2% up to 50% of the selling price.

In some cases, a broker will quote an alternative schedule of base percentage at one rate plus an incentive fee for getting a higher selling price. Also quoted are guaranteed fees plus a commission override, with the base fee generally going toward the payment of direct market expenses.

These are among the many variations the seller may encounter in working with brokers, presented here in roughly the order of increased commitment on the part of the broker as the selling agent.

The seller may also grant "exclusive" agent rights to a broker for a period of time, ususally 60 to 180 days another mechanism tending to increase the broker's commitment.

Given exclusive control over a particular piece of equipment, the broker or dealer/broker is free to advertise and work with other brokers. This tends to increase the level of sale activity for the unit in question.

At the other extreme, where no such control exists, the broker is considerably hamstrung in his ability to negotiate price, for he may be competing with other brokers on the same unit. He occasionally finds the unit he is trying to sell is being offered to him by another broker.

Many dealers (and leasing companies as well) utilize these same equipment brokers as aids to their own equipment distribution. In such cases, the commissions paid by dealers are normally considerably lower, for the dealership offers the broker a continuing source of equipment and a continuing relationship.

Several known dealers also serve as brokers, particularly for equipment they are not interested in handling for their own accounts.

Direct Sale

Still another method of equipment disposal is direct sale. The first step is direct advertising in commercial newspapers, computer industry, journals and/or specific applications publications (for example, banking magazines and journals).

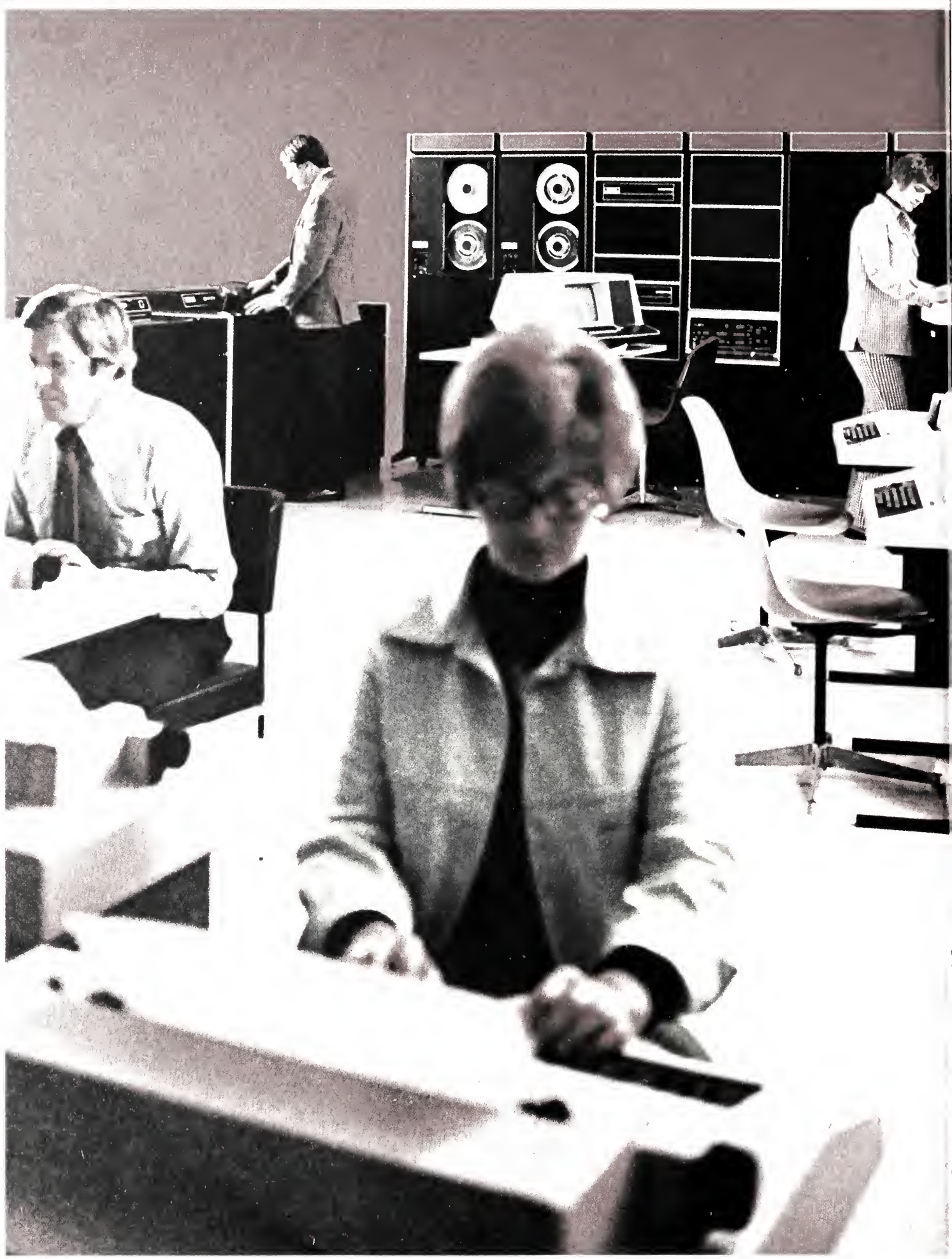
The seller will find substantial competition on such pages, which themselves serve as a measure of activity in used machines. For example, a recent issue of *Computerworld*, in a special classified section on equipment wanted or for sale, carried 65 advertisements for a wide variety of equipment ranging from a Burroughs ledger card system to an IBM 370/165.

The preponderance of IBM equipment represents actual market presence, combined with user demand. Equipment for which there is low demand or little observed used trading generally doesn't appear in dealers' advertisements, but instead in ads placed by private owners.

Of our sample of 65 advertisements, only four were clearly identified as individual buyers or sellers. For the seller or buyer of equipment with few installations, mass advertising will have little effectiveness.

For older equipment, the seller can approach the appropriate user group, if it still exists. When attempting to dispose of very old equipment, the seller should contact the original manufacturer, which may want to repurchase the equipment for replacements parts or which may be able to recommend potential buyers.

Monosson is a past president and now chairman of the Computer Dealers Association and is president of American Used Computer Corp.



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In a Sea of Options

Scrutiny Key to Selection of Key-to-Disk Equipment

By Teri Morehart
Special to Computerworld

Users who are switching from keypunch to modern key-to-disk equipment are finding the process more complex than they anticipated.

It's not the basic decision; the productivity increases of key-to-disk over keypunch are clear-cut and easy to translate into return-on-investment. The problem is which key-to-disk system to select – or, more precisely, which options should be included.

And those options are indeed myriad. Key-to-disk systems today range from what are called "plain vanilla" systems to what are essentially file management/processing systems with full sets of peripherals.

The pricing structures are equally complex. A feature which one vendor prices as an option may well be included in another vendor's base lease price.

Before even considering bells and whistles, a user should look at that plain vanilla system and see just how operationally sound it is.

The answers to a few basic questions should reveal exactly how convenient – and productive – the system will be. Samples are:

- How many keys must be operated to delete a record?
- How easy is it to make a correction?
- Does the operator have to get involved in batch balancing?

Then the user should take a close look at the hardware specifications. What really is offered?

Consider disk capacity, for example. Most vendors offer a 2.4M-char. disk and advertise 25,000 80-char. record storage. With typical requirements for system software, format libraries, edit routines and the like, a 2.4M-char. disk, in most cases, stores only about 18,000 data records.

It's best to know that fact at the outset because adding disk storage later can be expensive with some systems.

Memory allocation is another fuzzy area. If a user tries to operate a system on the marginal amount of core offered in some keypunch replacement systems, he may well regret it.

If insufficient core is provided, CRT screen response will be slowed with a corresponding reduction in operator productivity. Such a condition could also slow a batch transfer to an unacceptable rate.

Finally, a user should demand certain fail-safe features in any system. With cold recovery provisions, for example, a power failure is a relatively minor inconvenience. All data on the disk can be recovered and a hard-copy report covering every batch in the system is printed.

Bells and Whistles

While sound system provisions such as these are important to any system, the bells and whistles may or may not be important.

One nice sounding feature is dynamic disk allocation. Basically, it allocates a disk on a space-available basis. Initial disk entries are, therefore, tightly packed.

It sounds very useful, until a user finds that this process may require disk repacking.

Another widely touted feature is foreground editing, and here the individual application will dictate whether it is needed.

Foreground editing is extremely important for such applications as inventory control, where an item number error should be caught immediately.

For general applications, however, there are some questions whether it is worth the cost. Not only does foreground editing eat up core, it sharply cuts keying productivity.

Sort/merge is another widely offered option, consisting of software in the key-to-disk system which sequences the keyed data in a form the mainframe computer can accept directly.

For users looking for ways to offload their mainframes, sort/merge is a highly advantageous option. For users not currently using the full power of their computers, sort/merge probably isn't needed. However, make sure sort/merge can be added at a later date.

Printers are available in a wide range of speeds, and printers as fast as 600 line/min can be added to a key-to-disk system. Normally, however, this speed represents a nicety that is rarely needed. We find few applications where a little 10 char./sec teletypewriter doesn't suffice.

A user shouldn't carry this line of reasoning too far, however, and elect not to have any printing capability at all.

Morehart is manager of special programs at Computer Machinery Corp.

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Mini Bits

CSP Links Array Processor To HP 2100s Under RTE-3

BURLINGTON, Mass. – Hewlett-Packard Co. (HP) 2100 series minicomputers operating under the RTE-3 real-time executive can now be linked to the Macro Arithmetic Processor (MAP) array processor from CSP, Inc.

With the MAP, the HP systems can handle up to 15 million rounded 32-bit floating-point operation/sec and a wide range of algorithms, CSP said.

The MAP models with hardware and software interfacing to HP 2100 minis start at $8,400, CSP said from 209 Middlesex Tnpk., Burlington, Mass. 01803.

ISI Has Voice Response System

ANN ARBOR, Mich. – The Digitally Activated Voice Information Device (David) from Interface Systems, Inc. (ISI) is a voice response system that includes software and hardware interfaces for the Digital Equipment Corp. PDP-8 and PDP-11 and the Data General (DG) Nova.

The microprocessor-driven unit can be used at local or remote sites for voice response distributed networks, ISI said.

The voice is generated by a digitally driven, solid-state speech synthesizer.

David, which can be field-expanded from one to 16 lines for direct connection to AT&T's Data Access Arrangment, ranges in price from $6,750 to $47,500 depending on the configuration, the vendor added from 462 Jackson Plaza, Ann Arbor, Mich. 48103.

8K, 16K Add-Ons Fit LSI-11

HAWTHORNE, Calif. – A series of semiconductor memory modules for Digital Equipment Corp.'s LSI-11 minicomputer has been announced by Memory Systems, Inc.

The Mastermind series consists of two models, the 2000-8 with 8K 16-bit words and the 2000-16 with 16K 16-bit words.

Each has a 500 nsec access time with 800 nsec cycle time, Memory Systems said.

The Model 2000-8 is priced at $875 and the Model 2000-16 costs $1,450, the vendor added from 3341 W. El Segundo Blvd., Hawthorne, Calif. 90250.

National Semi Adds 8080 Type

SANTA CLARA, Calif. – National Semiconductor Corp. now has an Intel 8080A-type, general-purpose 8-bit micro called the INS8080A.

It is a direct pin-for-pin replacement for the Intel 8080A, the firm said.

The CPU costs $19.95 in lots of 100, National Semi said from 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

'Super Heavies' Found in Rock

Mini Helps Discover Natural Elements

By Esther Surden
Of the CW Staff

FORT LAUDERDALE, Fla. Evidence leading to the discovery of three more natural elements was found with the help of a computational minicomputer, according to the team of six physicists and one scientific programmer who announced the find here.

The results of the experiments, announced in June, have yet to be confirmed by other laboratories, but a rash of research activity is already taking place, Dr. William Nelson said. Nelson is a research physicist and one of the team members.

If the experiments are verified, the elements will be the first discovered in 51 years and the first natural elements ever discovered in this country, he noted.

Super Heavies

The elements are classified as "super heavies" and have atomic numbers of 116, 124 and 126 respectively, Nelson said.

The researchers were working in the laboratory facilities of Florida State University with a variety of specialized equipment. The nucleus of the lab is a giant Van de Graaff 20 million electron volt "proton tandem accelerator" from High Voltage Engineering in Burlington, Mass., which performed the proton bombardment necessary for the experiments.

The rest of the equipment includes a Univac EMR 6130 32K minicomputer on-line to the accelerator and a 64K Harris Corp. Slash 3 computational system linked to the 6130 by a Camac interface.

The grant for the research came from the National Science Foundation and the Environmental Protection Agency.

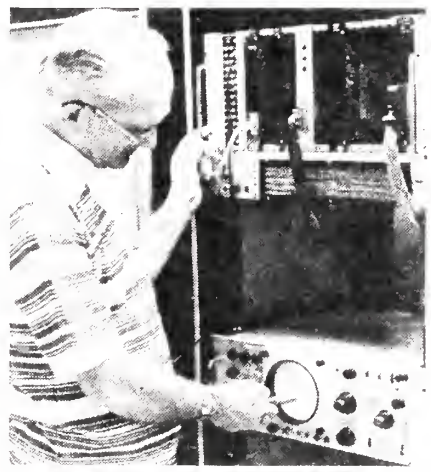
Started With a Rock

The research began when a rock from Africa generated the interest of Robert Gentry of Oak Ridge National Laboratories in the "giant halos" found in thy rock. The rock was made of mica, which can be peeled into planes, and the researcher noticed rocks of a different kind embedded in the mica.

Around these "inclusions" a spherical glow, or "halo," could be seen under a microscope, indicating alpha particles. But some of the halos were larger than others, and that meant there was some difference in the particles, Nelson said.

"All efforts to find such a difference were not successful until we tried the proton bombardment, which allows us to look at the elemental composition. We did find a difference. We saw some lines, and one way to explain them was through super heavy elements," Nelson explained.

Gentry brought his theory to Dr. Thomas Cahill of the University of California at Davis, who was scheduled to go to Florida State University to do some air pollution studies. The equipment needed was already there.



Dr. William Nelson demonstrates the use of the scope and light pen input devices to the minicomputer.

During the runs, the EMR 6130 minicomputer collected the data from the five-minute test and converted it from analog to digital and then stored it on magnetic tape.

This tape was then run into the Slash 3, where absorption corrections were performed and background subtraction and various other statistical techniques were applied.

When this was completed, the raw data was available in absolute concentrations for each element and output in the form of graphs, tabular results and magnetic tape for later analysis.

The program, designed by scientific programmer Henry Kaufmann, is a Fortran nonlinear least-squares fitting program that uses 48K words of memory. Using a library of peaks and nonlinear parameters, it fits a very large-scale model of what is happening to the data.

While it presently only fits 30 elements, Kaufmann is revising it to accept all of the super heavies, he said.

In addition to the pure scientific value

(Continued on Page 32)

On-Line System Proves Solution For Firm Stocking 12,000 Parts

MINNEAPOLIS – "With 12,000 separate parts in stock ready for some 37,000 possible assembly combinations, our problem is not so much production control as it is finding accurate means of regulating inventory," according to Ralph Lehner, DP manager for Raygo, Inc. here.

A small-scale system seems to be the solution, he added.

The company produces earth, asphalt and sanitary landfill compactors as well as earth levelers and soil stabilizers for the heavy construction industry.

For some years, inventory was managed with support from a DP service bureau which produced crib pick lists on established production schedules. Later, weekly reports on stock and materials on hand were added to the pick lists and monthly requirement reports.

"With our growth, the cost of the service bureau was approaching the break-even point. We ultimately came to feel there was an overall lack of value received in terms of the reports we were getting and the increasing demands of our production," Lehner said.

"Since Raygo is primarily an assembly operation, its main problem is inventory, not production control," he explained.

Prior to choosing a small-scale system for its inventory control application, Raygo went through a thorough screening process. Most of the minicomputer manufacturers such as Digital Equipment Corp. and Data General Corp. were removed from consideration because they couldn't offer the necessary applications software, Lehner said.

The field narrowed to Honeywell, IBM, Singer and NCR. NCR received the nod because it offered the most software for the price, he indicated.

To support its inventory management functions, Raygo is now using an NCR Century 101 providing on-line service to terminals located in the plant.

The system, set up under Lehner's direction, enters each newly received stock item into inspection status in the computer files when its arrival is noted on a terminal at the receiving docks. The system continues to keep track of the item's movement from the time it is accepted into inventory until it is put into production.

The exact status and location of a single item or any stock of items may be reported to anyone concerned with inventory or production controls.

The Century 101 was delivered to Raygo in the Spring of 1975. Raygo con-

(Continued on Page 32)

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PRIME

Sweda Gives Roytron Serial Compatibility

PINE BROOK, N.J. – Sweda International has introduced the Model 1560-S, a Roytron paper tape reader/punch with serial interface compatibility, according to a spokesman.

The unit can be connected to the serial port of most minicomputers and microprocessors and can also sit between a terminal device and its associated modem, the spokesman noted.

The punch is designed to operate at speeds up to 60 char./sec, perforating all varieties of normally used commercial tape.

The reader utilizes a stepping motor tape transport, he added.

Internal switches allow for reader data rates of 50- to 2,400 bit/sec. A quietized housing produces a low noise level, he said.

The unit costs $2,195 from Sweda at 34 Maple Ave., Pine Brook, N.J. 07058.

Ball Announces Disk Subsystem

SUNNYVALE, Calif. – Ball Computer Products, Inc. has a disk subsystem for Data General Corp. minicomputers, according to the firm.

The Model 250A subsystem incorporates a Ball BD-50 disk, an IBM 3330-type disk pack offering 50M bytes of on-line capacity and a controller capable of supporting up to four drives.

The BD-50 is designed to support file management techniques in real-time, multiterminal and batch systems. It incorporates a 3330-type spindle interface.

The subsystem costs $10,600 with one BD-50 disk drive, controller, disk pack, rack slides, terminators and connecting cables, Ball said from 860 E. Arques Ave., Sunnyvale, Calif. 94086.

Firm Moves to In-Houses System To Keep Track of 12,000 Parts

(Continued from Page 31)

verted the files from the previous service bureau operation for in-plant use, then built its own on-line programs.

The system consists of a central processor with 48,000 characters of memory, a 60M-character disk drive and a backup drive with 10M characters.

A 450 to 900 line/min printer provides the printed reports and a series of CRTs provide direct on-line communications to the system.

Business forecasts are generated with input from sales. These forecasts are translated by computer programs into production schedules, from which the subsequent material issue systems are based. Each production schedule has a two-year life, although in practice a somewhat shorter term is normal, Lehner said.

Labor availability data is also loaded into the system. From this input, a monthly overview of production scheduling is generated.

On-Line Purchasing

An on-line purchasing program is another feature of the Raygo system. A requirements planning module derives requirements from vendors, then places the purchase order to cover production needs.

In addition to the automated system, there is also a CRT in the purchasing department which provides a direct means of keying in and producing purchase orders, Lehner said.

When an item is received in stock, its part number and quantity are keyed into the CRT located at the receiving dock. The item then appears in an inspection status within the computer files and this information is available to all appropriate personnel through any CRT terminal.

The system at Raygo supports inventory management and purchasing applications.

After inspection, the inspector enters all valid parts on the CRT and moves the stock to a stores status. As it is stocked, the crib personnel again update the computer files by inputting the crib location into a CRT.

Prior to assembly, the items to be issued (as reported on the production schedules) are printed out on a picking list and sorted in location sequence by the system, which minimizes the picking time.

As a final step, the fact that an item has been taken from stock is entered into a CRT and current stock status is updated.

In addition to the information available on the CRTs, there are a number of management reports generated from the file data. One is a Material Requirement Package which details all materials needed each month. This printout shows items that will be in short supply and allows contract trackage of items needed in production forecasts.

Mini Aids Discovery Of 'Super Heavies'

(Continued from Page 31)

of the experiments, there are expected to be many beneficial spin-offs. Chief among these is the expectation that the discovered elements will open new areas of study in medicine and biology, with the elements possibly being used to power sophisticated pacemakers.

The Slash 3 complement at Florida State University consists of the CPU with 65K words of core memory, a scientific arithmetic unit, a 28M-byte disk, 600 line/min printer, operator's console and both a 7-track and a 9-track 45 in./sec tape deck. Rounding out the peripherals are a scope and light pen and a Versatec plotter/printer.

Photographed on location at Loch Duich, Scotland.

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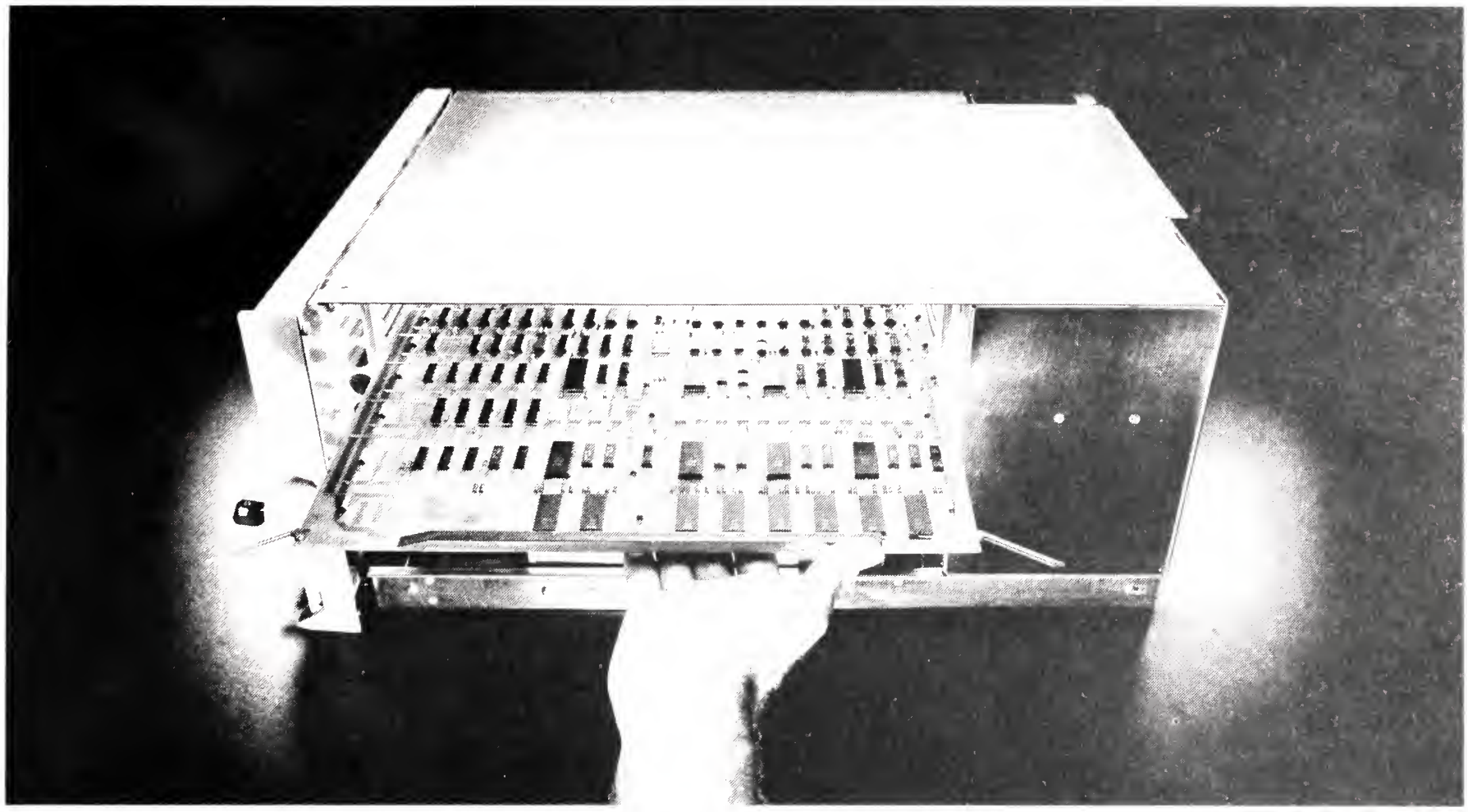

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Center of Data Acquisition System

Mini Improves Accuracy of Pacemaker Power Tests

MINNEAPOLIS – A data acquisition system built around a minicomputer has improved the accuracy as well as the speed of testing cardiac pacemaker power sources at Medtronic, Inc. here, the user said.

Chemical power sources, either single cells or multicell batteries, are a determining factor in the service life of cardiac pacemakers, according to Thomas Kuder, associate engineer at Medtronic and supervisor of the firm's power sources data acquisition system. Implantable cardiac pacemakers are the firm's major product line.

Prior to the installation of the automated data acquisition system, data from tests on cardiac pacemaker power sources was gathered manually and analyzed either with the aid of a calculator or a computer on a time-shared basis.

"By automating our tests, we've been able to gather more information over the running time of each test and to collect and analyze that information at least five to 10 times faster than we previously could," Kuder said.

The purpose of the testing is to evaluate the performance of various types of chemical power sources. The tests involve measuring the voltage of each battery or cell at specified intervals over periods of up to 10 years, Kuder explained.

Tests on 20 or more different types of power sources may be ongoing at any given time, with 50 to 250 of each type of power source included in each test batch, he said.

Walk-In Oven

Most of the tests are conducted in one of two walk-in ovens, each able to accommodate approximately 10,000 individual power sources.

The batteries and cells are attached to printed circuit boards, the reverse sides of which contain the circuitry which "discharges" the power sources.

The printed circuit boards are slid into racks inside the walk-in ovens, which are maintained at human body temperature. Each of the racks is wired to the test console of the data acquisition system.

The test console includes a programmable scanner, a programmable multimeter and a digital clock. The multimeter and scanner, under control of the Wang 2200, a minicomputer, take the voltage readings of each power source via plug connection from the test console to the printed circuit board inside the walk-in oven, Kuder explained.

Power source voltage data is transmitted from the test console to the minicomputer with CRT display, keyboard and 20,000 bytes of memory; a dual diskette drive; and a combination printer/plotter.

Kuder wrote all of the system software himself, although he had no previous experience with Basic. "It was a fairly difficult job because the software is very complex – it does a lot of things," he said, "but Basic was an easy language to learn."

The technicians formerly responsible for collecting test data manually now operate the computer system, he noted, adding "they are more involved in the testing process itself now that they use the computer."

The system maintains a schedule of all power source testing in progress. Each day, one of the technicians calls for a list from the computer of all tests due to be "read" that day.

In addition to providing that list, the mini displays the appropriate manual plug connection needed for each test reading.

To ensure the proper connection is made – and the appropriate test is read – the system verifies the plug connection by using the scanner and multimeter to read a known resistance assigned to each plug. Once the connection is made, the multimeter and scanner are directed to read the power source voltages and transmit them to the computer.

"The computer next displays the condition of that test on the CRT," Kuder continued. "The display includes summary statistics, like the mean and standard deviation of voltage readings, both for the present and the previous reading time. The system highlights those individual voltage readings outside certain designated limits.

"The technician has the option of calling for the voltage reading of each individual battery or cell, and he has the option of rereading the test. He then decides whether or not he wants to save the results of the reading.

Updating History File

"He can update the history file on that particular test, which he will do if any test member had been taken off test since the last reading. When he is finished, he moves on to read the next test," Kuder said.

When each test is completed – and some tests now on the system have been in progress seven years – the system automatically creates a permanent data file and prints an end-of-test report. In addition, Kuder noted, the system can plot voltage/time and voltage/capacity graphs and perform linear regression and a variety of other analyses of the completed test data.

"The data acquisition system has given us improved reliability in the areas of data acquisition, data storage and data analysis over our previous power source testing methods," he said.

The manual method of collecting test data involved a technician walking into a test oven and removing batteries and cells. Voltages were measured manually by touching each individual power source with the probes of a voltmeter.

"It was possible to short-circuit a power source during that handling, which meant eliminating each shorted unit from that test group," Kuder said. "Another disadvantage was that the power sources had to be removed from the body temperature environment for measurement."

Power Not Disturbed

Power sources under test now remain undisturbed during voltage readings, he said; the temperature therefore remains constant and the danger of short circuits is greatly reduced.

Another disadvantage of the manual testing method was the time involved in data analysis. "A decision might require the comparison of perhaps a dozen different tests on one type of power source. We'd want to look at the performance of that source over time, and quite often we'd need that information the following day," Kuder said.

The system provides regular reports which update and summarize all ongoing tests. Those reports reduce the need for "next-day" analyses, he added.

Dr. Dixon Doll will show you how to plan and manage effective data communications systems.

Data communications has become a focal point for new growth, and new economies, in computer use. But there are many hazards for the user. Even many up-and-running systems have costly flaws that can be improved through better management methods. And that's where these seminars come in.

Computerworld has sponsored Dr. Dixon Doll's two seminars on data communications because step-by-step, they give you the practical information you need to evaluate data communications networks and use them effectively.

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2. Data Communications Course #1020 — Advanced Teleprocessing Systems Analysis and Design. Course 1020 will give you an in-depth familiarity with techniques for planning, designing and managing cost-effective commercial data communications networks. Class study and discussion of specific telecommunications problems affecting your organization is an important part of this three-day seminar, and you'll have the opportunity to present such problems for analysis by the instructor and class members. You will also participate in project teams assigned to individual data network case studies, and you'll see what approaches have been taken by other organizations with networking problems similar to your own. Like Course 1010, this seminar will focus on recent developments in data communications. But Course 1020 will concentrate on greater depth and detail. It assumes that attendees are already involved with and experienced in data communications networks, and that they desire very detailed knowledge in the field. Emphasis will be placed on thoroughly examining contemporary cost-reduction networking ideas, along with specific procedures for implementing them. Design problems associated with terminal selection and line organization will be addressed in detail as they apply to recent developments like SDLC, satellite transmission and integrated multiapplication nets. Algorithms for determining line speeds, number of ports the optimum mix of WATS and DDD for switched nets will also be examined. This seminar will give you the ability to perform your own design calculations, and it will enable you to recognize areas in present (or proposed) systems where cost savings are possible. And you will gain practical mastery of the techniques you need to realize these savings.

Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and 10 concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Proctor & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

Charges and Enrollment

The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

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CI Notes

TRW Buying OCR Wands From RPI for $15 Million

DALLAS – Recognition Products, Inc. (RPI) has received a $15 million contract from TRW for substantial quantities of its hand-held optical character recognition (OCR) wands to be attached to point-of-sale terminals.

Deliveries are scheduled to begin immediately and last for 20 months.

The OCR wands read alphabetic and numeric characters rather than bar codes. RPI is a wholly owned subsidiary of Recognition Equipment, Inc.

Inforex Changing Personnel Mix

BURLINGTON, Mass. – Inforex Corp. has reduced its employment rolls by 71 persons in the U.S. in preparation for reshaping personnel skills.

The firm said it recognized the need to add people who have both systems and software skills to reflect the increased use of microprocessors. Inforex plans to introduce a distributed data entry product this year.

In addition, Inforex is increasing its U.S. sales force by 20% by year-end, and a number of administrative positions have been eliminated in order to shift resources to the sales force.

About one-third of the 71 employees was in the engineering group, primarily with hardware skills, and one-half in indirect manufacturing.

The firm may be hiring direct production personnel before year-end, according to Tim Cronin, Inforex chairman.

HIS Forms Printer Group

WALTHAM, Mass. – Honeywell Information Systems, Inc. (HIS) has formed a separate group to handle all aspects of its high-speed, non-impact printer products.

The group, called the Page Printing System (PPS) organization, will be headed by Ronald F. Borelli, who will be in charge of management direction for engineering, manufacturing, supplies, home office product marketing and field marketing support activities as well as business planning.

"The new organization will capitalize on the promising worldwide market potential of the PPS and related future products by centralizing all product-related activities under single direction," according to Lee E. Sheehan, vice-president and manager for the company's North American computer operations.

Supershort

Prime Computer, Inc. has signed Saudi Computer and Management Consultants as its distributor in the Arab countries.

SIA Founder Predicts

Market Expanding for Software Firms

By Toni Wiseman
Of the CW Staff

NEW YORK – The trend toward decentralization and its accompanying trend toward turnkey systems may well hold the key to the future for many software companies, according to a founding member of the Software Industry Association (SIA).

The growth of minicomputers and microprocessors must be credited with a large portion of the software vendors' good fortune, Lawrence Schoenberg said in a recent interview.

The total U.S. software purchases by computer users and hardware manufacturers rose from $270 million in 1973 to $500 million in 1974 and $655 million in 1975, according to SIA figures. Between now and 1984, some $19 billion will be spent on software.

Of the approximately 800 independent software suppliers in business today, less than half realize more than $1 million in annual sales; about 1% do about 10% of the business, the SIA estimated.

Therefore, if there is no change in the structure of the industry by 1984 and 1% of the firms still do 10% of the volume, about eight companies will share a $350 million market, based on projected $3.5 billion volume by 1984.

Room for More Vendors

Schoenberg, however, feels there is room for many small companies in the marketplace.

Large companies have started to decentralize very rapidly, Schoenberg said, and in decentralizing functions they are also decentralizing authority for DP selection.

"The people who are now involved in making DP decisions are not the old computer people who historically were always the conduits for all computer work of various departments in a large company.

"Now this kind of power has been spread into the operating people, the marketing people, the engineering and the production people, so each one of these is now making decisions about his own equipment," he said.

This means, he noted, "that they are no longer interested in someone just coming in and writing programs for them; they have to have hardware as well."

This has resulted in a tremendous movement toward turnkey systems he said, with large companies requesting software vendors to put in bids that include both hardware and software.

Banks in particular are applying pressure on software vendors to provide total systems, he noted.

So, in addition to the regular problems, software companies are being faced with "white-collar" hardware/software problems, such as interfacing with particular units, Schoenberg said.

Small Business Sector

A second burgeoning area for the software industry, one which none of the "traditional" people are doing anything about, is small companies, Schoenberg stated.

"You have hundreds of thousands of them which are likely to be automating with computers over the next few years, and you have again the whole turnkey system approach," he said.

The problem from the software vendors' viewpoint is that the marketing impact so far has come from the mini manufacturers, which are "essentially representing out in the field that software is only 20% of the cost," Schoenberg said.

"They [the mini makers] want a bigger share of the bucks and try to leave very few dollars on the table, so none of us who have been in the business for a long time can figure out how anyone else can ever make money on it," he said.

There is a long list of companies who have failed in this sector of the software industry, Schoenberg said. "There are almost no companies that have ever made money and certainly the number that have is so miniscule compared with the number that have lost money that it's staggering," he added.

"Yet anyone can look out there and see that there's a gigantic marketplace," he said.

Growth of Marketplace

Vendors are always trying to discourage possible competitors from entering the software field, telling them it's impossible to make a buck, Schoenberg said.

"Fortunately for the economy, that's sheer malarkey. People were able to enter the field during the worst of recessions and still make money," he stated.

Growth for the computer software industry has hardly started, he said, and the reason is that almost all the work in the past has been white-collar work – after-the-fact work where someone generates a record and the software firm automates it.

"But now we're starting to see companies attempt to use computers in their main operations, in the basic flow of their

(Continued on Page 36)

DBMS Offerings Can Strengthen Vendor Account Control: Brueck

By Edith Holmes
Of the CW Staff

NEW YORK – Because data base management systems (DBMS) are powerful tools which are particularly attractive to users, the vendor which controls their supply strengthens its account control, according to Robert L. Brueck, president of MRI Systems Corp.

Defining "account control" as "a condition, from the vendor viewpoint, of being able to supply all products needed to take care of a customer," Brueck testified at the US vs. IBM antitrust trial recently that IBM holds 43% to 45% of the DBMS market.

IBM has attained 55% to 60% of the dollar value spent for DBMS software packages, he continued, citing International Data Corp. figures.

System 2000, MRI's DBMS, has 4% to 5% of the overall market; its percent of the dollar value spent is somewhat higher because System 2000 carries a larger price tag, Brueck said.

IBM's DBMS, IMS, rents for about $1,500- to $2,000/mo, he explained. System 2000 costs about $3,000/mo.

First announced in 1970 to run on Control Data Corp. computers, System 2000 was rewritten to operate on Univac 1100 equipment and on IBM 360/370 machines in the 1971-73 time frame, he said.

When Brueck sought capital sources for rewriting the System 2000, however, he had trouble finding people who would invest in his company, he told the court.

In detailing the reasons why MRI encountered investment difficulties, he suggested a number of larger software firms had just written off investment advances against their earnings during the early '70s.

In addition, software practitioners were considered performers of some kind of "black art" and hardware people really didn't understand what the programming business was all about, Brueck said. With the money market so tight and competition for funds so tough, he indicated, no one would invest in an unsure thing.

Finally, Brueck said, MRI was developing a product where the main market was IBM computers, thus putting the company in direct competition with the mainframer. No one in the investment market considered this kind of competition favorable, he said.

Today, between 65% and 70% of System 2000 installations are in IBM shops,

(Continued on Page 36)

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Court Told DBMS Strengthen Vendors' Account Control

(Continued from Page 35)

he estimated. Twelve percent to 15% are on CDC machines and the remaining 15% to 20% are on Univac machines.

Asked about the lengths to which MRI must go to redesign its product for other manufacturers' machines, Brueck said he has considered rewriting the DBMS for Honeywell mainframes. This effort would require $350,000 to $500,000, he estimated, depending how many modules of the system are rewritten.

Machines from Burroughs and Digital Equipment Corp. and several of the minicomputer makers would be good candidates for a redesign effort, Brueck said, again stressing "given the necessary funds."

Brueck emphasized the difficulty of writing software that is compatible with the hardware of all manufacturers. Even the two levels of System 2000 available aren't compatible, he noted.

MRI made major design changes in the structure and storage of data between Levels I and II. In addition, System 2000 is not easily transferable because it is written in Assembler for the most part, he added.

DBMS using Cobol and Fortran have a higher transferability rate, he said.

IBM's IMS is not machine-independent and has never been rewritten to run on other manufacturers' machines, to Brueck's knowledge. And IMS I has not been supported by the mainframer since the introduction of its virtual storage version, IMS/VS, he said.

But, an IBM spokesman later said, "IMS as used on 360 equipment is currently supported by IBM."

Users of IMS and System 2000 are "locked in" if they want to think about changing DBMS without giving up the capabilities and functions they have and starting over, Brueck stated, adding he considers "lock in" a term used for dramatic effect. He said he couldn't estimate the cost of going from IMS to System 2000, but it would be easier to go from a system like IMS with a data base language to System 2000.

When IBM introduced its VS2 Release 1.7 operating system, Brueck said, MRI's DBMS was not able to operate fully under it. In particular, he noted, System 2000's multiuser capability couldn't function.

The problem for MRI was obtaining the necessary information from IBM to provide that capability to users once again, he stated.

While he didn't know exactly how this IBM release affected MRI's marketing effort for System 2000, Brueck said he couldn't see how the operating system helped it.

In addition, MRI was slow to recognize its users would encounter the loss of the multiuser capability. Eventually, the necessary changes were made in System 2000, but it took about 18 months, from the December 1973 announcements of IMS/VS and the VS2 operating system release to mid-1975, Brueck said.

During that period, information MRI received from IBM on the problem was skimpy, inadequate and often delayed, he added. IBM considered its source code proprietary – and rightly so, Brueck stated, noting MRI was able to get the code by signing a software license agreement.

MRI used the license for one month, paid the fees for it and returned it to IBM, he said.

MRI had to adapt its data base system to run under IBM's VS2 because a number of MRI customers with IBM machines wanted to move to this operating system, according to the company's president.

In addition, a number of MRI's prospects – "rightly or wrongly" – were led to believe independents like MRI could not maintain compatibility with IBM systems in the face of interface and other engineering changes in system hardware and software, Brueck said.

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Dataproducts Plans New Printer Family

NEW YORK – Dataproducts Corp.'s plans for a new printer family are proceeding apace, according to the firm's president, Graham Tyson.

One family of printers, which will offer substantially lower prices but remain in the traditional speed range of 300- to 1,800 line/min, is in the prototype phase; tooling has already begun, he told the New York Society of Security Analysts recently.

Eyes Low-Speed Market

In addition, Tyson said, the firm plans to enter the lower speed printer market, but he declined to give more information.

Printers account for 75% of Dataproducts' revenues; another 15% comes from its core memory business; and the remaining 10% comes from its Stelma subsidiary, which provides communications technical controls.

By concentrating on the core markets with the greatest longevity, the firm has "uniquely maintained strong, profitable operations" during the recession, and it is looking forward to a year "that could be as successful as any we have had in the past," he said.

The firm's market concentration is in areas where core has natural advantages over semiconductor, such as systems requiring very large storage, subject to adverse environments or requiring known long-term reliability, Tyson said.

Market for Software Growing: Schoenberg

(Continued from Page 35)

work, and that's a whole wild new area which is totally changing the scope of events," Schoenberg said.

In these instances, he said, firms are less likely to convert their methods to accommodate packages than when using packages for accounting functions.

Packages may be "a meaningful base from which you begin to develop a system for a specific company, but it's hard to envision that the package is going to represent a very high percentage of the total dollars expended on the finished product," he remarked.

Schoenberg, who is president of AGS Computers, said his software firm has grown at least 50% a year for the last 10 years and is expecting to grow about 70% to 80% this year. This trend is typical among software companies, he stated.

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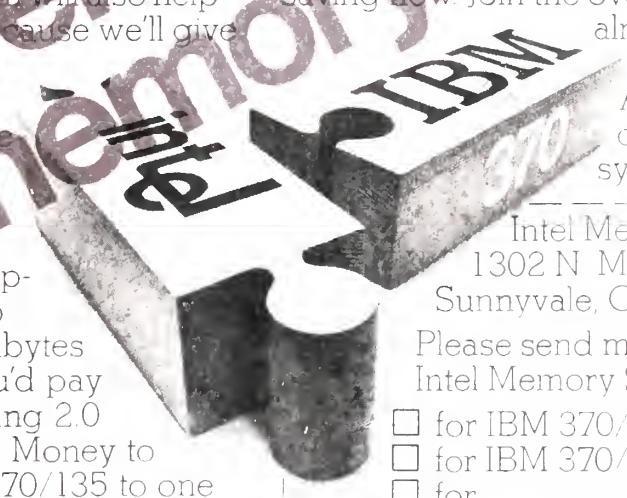

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Westinghouse Packages Doing Well in West Germany

By Ivan Berenyi
Special to Computerworld

MUNICH, W. Germany – For U.S. software houses with European subsidiaries and for suppliers of U.S. packages, the economic recovery has not come a moment too soon. After two or three lean years, they are poised for a new boom – particularly in West Germany.

Westinghouse is a comparative newcomer to the European software market but, according to its regional software sales chief for German-speaking Europe, Vinod Bahl, its current growth rate is little short of phenomenal.

"We started from scratch in 1972, yet now have more than 320 customers," he said. "Our monthly turnover is $46,800 to $54,600, and sales are increasing so rapidly that I expect this to rise to $78,000 within six months.

"West Germany is the largest and fastest growing single market for Westinghouse software products in the whole of Europe," he said, but the company has also picked up 70 to 80 customers in the Basel-Zurich area in Switzerland and about 20 in Austria in little more than a year. Holland boasts 25 to 30 additional customers.

International News

The recession has unquestionably helped to win over clients for Westinghouse's off-the-shelf software in a market which has traditionally been package-shy.

The oldest and most popular of the company's products is the disk utility package, which now has 250 users in German-speaking Europe.

The dump and restore package, an OS version of the same product, has proved almost as popular, and orders for later packages, like the Asap spooling software and Fast Linkage Editor, are also building up.

"The largest multiple users are banks," Bahl stated. "Bayerische Sparkasse has 16 installations, for instance, and Swissbank is another multiple user."

German DP Mart To Increase 16% Annually

SAN FRANCISCO – The DP market in West Germany will grow at an average annual rate of 16% and result in a $2.6 billion total market in 1977, according to a recent report by Fred Glynn/Marketing Research.

The report cited a U.S. Department of Commerce survey which indicated the use of computers and related equipment in West Germany is more extensive and more sophisticated than in any other nation except the U.S.

Total minicomputer sales will rise 170% over the 1972-77 period, jumping from $209 million to $565.7 million, the Glynn report stated.

During the same five-year period, annual sales of independently purchased peripheral equipment are forecast to increase from $180.7 million to $732.2 million, while data transmission equipment sales will grow at an average 47% annually, from $17.3 million to $119.4 million.

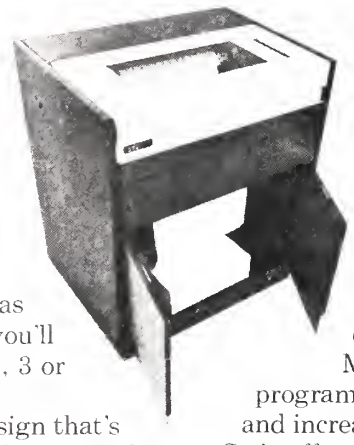
U.S. Leads

The U.S. historically has been West Germany's leading supplier of DP equipment, the Glynn report noted. "Trade sources predict that the technological superiority of U.S.-made equipment will enable American manufacturers to increase their strong lead during the 1973-77 period with the U.S. share forecast to climb from 48% or $303 million in 1972 to 57% or $636 million in 1977," the report stated.

Other major suppliers include France (14%), the UK (12%) and Italy (10%).

While the minicomputer share of the West German market is forecast to rise from 16.5% in 1972 to 21.5% in 1977, the market for small, medium and large systems will also remain strong with aggregate annual sales for the five-year period expected to exceed $5.3 billion.

In this case, the "little something" is $10,500. That's the amount you save when you exchange your 300 lpm IBM printer for our BST/550 over a 5-year lease period. Besides increasing your print speed by 250 lpm, you'll keep $178 more in your pocket each month. Guaranteed. Because unlike IBM, we won't surprise you with price increases for as long as your lease lasts. Of course, you'll also save when you go with our 1, 2, 3 or 4-year lease plans.



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CIRCULATION DEPARTMENT

But Profitable, Capex Head Says

Independent Software Seen Boosting IBM in Market

By Nancy French
Of the CW Staff

PHOENIX – By designing efficient systems software for IBM hardware, "independent software firms are actually enhancing IBM's competitive position, and that's too bad, but that's the only way we can make a fair profit," A. LeRoy Ellison, president of Capex Corp., said in an interview here recently.

If IBM's competitors were smart, they all would use the same instruction set and program interfaces for their systems, he said. This standardization would make it profitable for firms like Capex to bring non-IBM users the specialized systems that are now available only in the IBM marketplace.

This would make non-IBM systems more attractive to users and "improve business for everyone," he said.

Ellison blamed "the egos of computer designers" for the useless proliferation of unique instruction sets in the non-IBM world.

Capex was founded in August 1969, just two months before IBM unbundled its software and services. The original staff of eight were former General Electric and Univac people who felt the hardware manufacturers didn't really understand software, Ellison said.

Found Software Not Portable

At first Capex intended to furnish software packages for all manufacturers' systems but it soon learned systems software and operating systems were not at all portable, he said.

Starting from Square one, it took a technical team just as long to produce a system that would run on Univac systems, for example, as it did for one that worked on IBM machines – with only a fraction of the potential return on that investment of time and money.

Way over half the market still is running IBM 360s, providing a very large, homogeneous, software-compatible marketplace with thousands of potential customers, Ellison noted.

The other half is divided up among the various competitors, with each of them having only a few hundred, he said. Thus, IBM systems "is where the action is" from a profit standpoint.

Capex was financed with venture capital, according to Ellison, and the firm became profitable in 22 months. Today, the software company employs 40 people in eight sales offices in the U.S. and Canada. Capex software is marketed by other software vendors in other parts of the world, according to Don Rosner, vice-president of marketing.

Still privately held, the firm grew "in steady increments" until 1975 when sales surged ahead by 50%, according to Ellison, who said he expects growth to continue at that level.

Since January, Capex has chalked up a 35% increase in gross sales, and first-quarter earnings were right on target, Rosner said.

To individuals interested in starting an independent software house, Ellison gave this advice: it's harder to succeed than it appears. you have to do a good marketing job and have lots of staying power, he said.

Selling Strategy

Capex does its selling by slipping gently into an account with a sales contract and free use of its product for 30 days.

A technical representative installs the product, and the user can try it and return it in less than 30 days with no obligation, according to Rosner.

If he hasn't returned it at the end of that 30-day period, the sales contract automatically goes into effect.

In most cases customer problems can be diagnosed over the phone, or by examining a dump sent to Phoenix by mail.

Rosner could remember only one instance in the past year where a technical representative from Phoenix was sent to a customer's site.

Target Marketplace

Capex has aimed its products at the commercial rather than the scientific marketplace, and is oriented principally toward Cobol, Rosner said.

Its products are geared for IBM 370/135s or larger, run under OS or OS/VS, he said.

Its software falls into two broad categories: systems products and end-user products.

Among its systems products Capex offers PL-IV to help DP managers identify bottlenecks and improve programming reliability.

Cotune II works with the Cobol compiler on source code to make for smaller, more efficient programs, according to Rosner. A VS user might find it helpful in reducing paging, he said.

Among its end-user products the company offers Autotab II for use by nonprogrammers in financial planning, modeling and manipulation of rows and columns of numbers.

The Financial Result Simulation System (FRSS) models operations of a medium-size bank. On it, the nonprogramming user can model and assess the impact of changes in federal regulations.

The license prices for these systems products range from $5,000 to $20,000, plus an annual maintenance fee.

CW Photos by N. French
A. LeRoy Ellison

Don Rosner

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Shugart Drives Hit 30,000

SUNNYVALE, Calif. – Shugart Associates has shipped its 30,000th floppy disk drive.

"The fact that we made the quantum leap from 10,000 to 30,000 units in just eight months gives some indication of the growth in demand for low-cost random-access disk storage products such as our floppy," President Donald J. Massaro said.

"We believe that on the strength of our contracts and shipping rates, we now hold a commanding 45% share of the independent floppy drive market.

"In addition, figures show we are now booking 75% of the available major OEM contracts for floppies," he said.

Shugart recently announced long-range contracts with General Electric, Data 100, Univac, Applied Digital Data Systems, Hewlett-Packard, 3M, Tanbergs and Varityper, according to Massaro. He indicated "several more" are in the negotiation stage at this time.

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Two Named to IBM Vice-Presidencies

ARMONK, N.Y. – John F. Akers and James J. Forese have been elected vice-presidents of IBM.

Akers continues as president of the Data Processing Division, a post he has held since April 1974.

Forese was recently appointed president of the Office Products Division. He has been vice-president of finance and planning for the IBM World Trade Corp., IBM assistant treasurer and assistant group executive of the General Business Group.

Rogers World Trade Officer

MOUNT PLEASANT, N.Y. – C.B. Rogers Jr. has been elected to the board of directors of IBM World Trade Americas/Far East Corp.

Rogers is an IBM vice-president and president of IBM's General Systems Division.

Thompson Named at Sperry

NEW YORK – Kenneth F. Thompson has been elected an executive vice-president of Sperry Rand Corp.

Thompson will continue to serve as president of Sperry New Holland, the corporation's agricultural equipment division.

Other Moves

■ E. Gary Clark, a vice-president for large accounts development at Burroughs Corp. since 1974, has been appointed president and chief operating officer of Data Transmission Co. (Datran).

■ Decision Data Computer Corp. has elected four vice-presidents in different parts of the company. The list includes James J. Lysek, vice-president of finance and chief financial officer; Richard F. Taylor, vice-president of operations; Arthur B. Levin, vice-president of product development; and Richard L. Schwab, vice-president of sales and service.

■ Phillip J. Bifulk has been named vice-president of management consulting services at Control Data Corp.

■ Joseph L. Levy and William P. Ford have been named vice-presidents of the eastern and central regions respectively at International Data Corp.

■ John A. Pittman has been named vice-president of marketing and field operations at Storage Technology Corp.

■ Arnold D. Palley has been elected president and chief operating officer and A.H. Brawner Jr. has been named to the board of directors of Brandon Applied Systems, Inc.

Executive Corner

■ Irving H. Hamlin has been appointed vice-president of marketing at Information Terminals Corp.

■ R. Bruce Sage has been elected president and a member of the board of directors of Wright Line of Canada Ltd.

■ Jean N. Tariot, formerly president of Incoterm Corp., has been named chairman and chief executive officer of the company; James F. Upton has been named president and chief operating officer.

■ M. Lloyd Bond has been appointed vice-president of sales of T-Bar, Inc.

■ Richard P. Carroll has been named vice-president of marketing and Donald R. Haring has been named vice-president of engineering at General Automation, Inc.

■ Harold L. Ergott has been appointed vice-president of computer products of the Norden Division of United Technologies and will manage Norden's newly formed Computer Products Center.

■ Richard Palmer has been named vice-president of international operations at Interdata, Inc.

■ Frank Edelstein and William W. Neal have been named staff vice-presidents of commercial services products and commercial service sales respectively at Automatic Data Processing, Inc.

Orders & Installations

GMS Systems of Chattannoga has installed the first Aide Transaction Processing System from Interactive System Technology.

The General Services Administration has ordered a Univac 1108-11 from American Used Computer Corp. for installation at the U.S. Army Missile Command.

Citibank has ordered a commercial automatic handwriting system, Signac, from Veripen, Inc.

Optimum Systems, Inc. has installed an IBM 370/168 Model III in its Santa Clara data center.

The Associated Press has ordered Delta 400 video display terminals from Delta Data Systems Corp. for use in its wire service network.

Avco Computer Services has installed an IBM 370/158 Model 3 to increase its DP capacity.

The Banking Center of Waterbury, Conn., has installed a Capacity Meter, a computer performance measurement system manufactured by CRU.

William H. Roberts & Sons, Inc. has installed a Burroughs B1700 system.

The State of Colorado has installed Adabas from Software AG as the data base system to be eventually available to all state agencies using the central DP facility.

Augsburg Publishing House of Minneapolis has installed a Burroughs B1726 system for filling subscriptions, inventory control, job costing, sales analysis and payroll.

The University of California has ordered the Libs 100 automated circulation control system from Computer Library Services, Inc. for a university-wide program for automation of library circulation operations.

The First National Bank of Richmond, Texas, has ordered a B700 system, AE 501 audit entry data preparation system and a SI500 data capture, transmission and document encoding system from Burroughs.

The State of Washington has installed a Univac 1100/41 system as part of the state's DP consolidation plan.

The University of Vermont has installed a Registration and Student Scheduling System assembled from Systems & Computer Technology Corp.'s Library of College and University Systems (Locus).

New Companies

Time Sharing Terminals, Inc. has been formed to provide end users and OEM's with terminals, ribbons and paper supplies. Service is available on a national basis, according to the firm at 8 Butterfield Court, Greenlawn, N.Y. 11740.

Machover Associates Corp. specializes in consulting services on computer graphics. Offices are located at 199 Main St., White Plains, N.Y.

Multiple Financial Services Ltd. is being formed to combine the investment fund administrative services of AGF Management with the processing service of Multiple Access, a supplier of computerized investment accounting.

Services will include processing of registered retirement savings plans, registered home ownership plans, investment trusts, deferred profit sharing plans and tax savings plans sold by insurance firms, the firm said.

Multiple Access, based at 405 Ogilvy Ave., Montreal, Quebec, H3N 1M4, will hold a majority interest in the firm.

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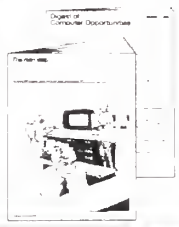

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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).
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Omaha, Neb.	(402) 397-8115
Philadelphia, Pa.	(215) 665-9430
Rochester, N.Y.	(716) 325-1660
St. Louis, Mo.	(314) 731-6800
Stamford, Conn.	(203) 327-2030
San Antonia, Tx.	(512) 826-8666
San Francisco, Ca.	(415) 981-5950
Troy, Mi.	(313) 585-4200
Washington, D.C.	(202) 452-9100
Wichita, Ka.	(316) 263-4991

COMPU SEARCH
Div. of Management Recruiters, Inc.

PROGRAMMERS & ANALYSTS

SUNNY FLORIDA

BCC is the data processing arm of a $2.3 billion statewide banking organization. Six regional centers feed two 158's under OS/VS1 to serve over a million customers. Our growth is exciting; the challenges are tremendous.

Proven achievers are needed immediately as APPLICATIONS PROGRAMMER/ANALYSTS, PLANNING ANALYSTS, and SYSTEMS PROGRAMMERS. Exposure to banking systems is a definite plus.

If you desire professional growth in an environment that recognizes excellence, we offer attractive salary, benefits, and promotional opportunities. Send your resume and salary history in confidence to Manager of Personnel.

Barnett Bank

BARNETT COMPUTING COMPANY
P.O. Box 10068
Jacksonville, Florida 32207
A subsidiary of Barnett Banks of Florida, Inc.
An Equal Opportunity Employer

SENIOR SYSTEMS ANALYST

NCR's Communication Systems Division is seeking an experienced Systems Analyst with a strong background in software evaluation. Familiarity with microprocessors used in terminals, controllers front-end systems and 8080 assembler language required. COBOL language and operating systems experience helpful. Please send your resume and salary requirements in complete confidence to:

Industrial Relations Department
Communication Systems Division
NCR Corporation
3325 Platt Springs Road
West Columbia, S.C. 29169

NCR

An Equal Opportunity Employer

Faculty Position

Data Processing

Many leading technical minds have banded together to provide qualified deaf students with continuing education. These professionals enjoy the support of the Rochester Institute of Technology and an existing construction expansion program.

This opportunity calls for an individual with a Degree in Computer Science or related field, 3 years experience-business or industry, with emphasis on COBOL. Master's Degree and teaching experience preferred, but not required. Programming project supervision background desired. The position requires knowledge of or willingness to learn Manual Communication.

You will teach Introduction to D.P., COBOL, BAL, Introduction to Systems Design and/or D.P. Project classes. Responsibilities also include curriculum development, academic advising, tutoring and planning.

Besides unusually rewarding career satisfaction, you'll enjoy an attractive salary and benefits program. Please send your resume or "C.V." in strict confidence to:

NTID PERSONNEL COORDINATOR.
NATIONAL TECHNICAL INSTITUTE FOR THE DEAF
ROCHESTER INSTITUTE OF TECHNOLOGY
One Lomb Memorial Drive
Rochester, New York 14623
An Equal Opportunity Employer

Software Specialists

We have immediate opportunities for Software Specialist in the following areas:

370/158 VM CP/CMS

To support and enhance applications, assist programmers in coding difficult or critical parts of applications, and serve as Consultant on operating system-application interface problems. Large systems design experience, planning, and coordination skills desirable. Opportunity for early advancement to project leadership if desired.

DISTRIBUTED PROCESSING

To design and implement a distributed processing capability using DEC PDP-10's, IBM 370's, TYMNET (our international communications network), intelligent terminals and minis. These components, programmed on-line in several languages will be intergrated into structured systems supporting application development. We're looking for professionals with broad experience and knowledge to create high quality products. Good written and oral communication skills are a necessity.

These positions all offer excellent salaries and benefits, plus exciting advancement potential with a leader!

If qualified, send your resume with salary history in confidence to:

TYMSHARE INC.
J. MALONE
(408) 257-6550
20705 Valley Green Drive
Cupertino, Calif. 95014

Equal Opportunity Employer m/f

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Programmers Engineers

SYSTEMS PROGRAMMERS SYSTEMS ENGINEERS

Amdahl 470V/6 shipments are creating exciting career opportunities for qualified Systems Engineers and Systems Programmers. Positions exist both at our customer installation sites and at our California headquarters facility.

For the Systems Engineering positions, we seek individuals who have experience with large-scale OS/MVT or VS2 systems. A proven track record and self-motivation are prerequisites. Travel opportunities exist for those candidates who find it desirable.

The Systems Programmer candidates must have experience with OS/MVT or VS2 internals. Special consideration will be given to those with solid MVS experience.

For immediate consideration call (408) 735-4116 or send your resume to: Amdahl Corporation, Professional Employment, 1250 East Arques Avenue, Sunnyvale, California 94086. An Equal Opportunity Employer M/F.

amdahl

COMPUTER PROFESSIONALS

The automated health care industry is one of the fastest growing in the U.S. TELEMED Corporation is the world's largest processor of electrocardiograms (ECG's) by computer. We are a profitable, fast growing public company. We seek superior professionals with solid backgrounds in the following areas to fill immediate openings created by internal growth:

OPERATING SYSTEMS: You would work on one of the most sophisticated DEC systems 10 sites in the Midwest. We have plans to upgrade our existing 2 KI10s to 2 KL10s with 256K within one year. We need experienced people to develop assembly language application programs under TOPS10, do performance analysis, modify 6.02 TOPS10, and design and implement software for front end minicomputers in a real time, fault tolerant environment.

SYSTEM INTEGRATION: We need a real heavyweight in computers to integrate turnkey systems. Someone with extensive experience in assembler languages, operating systems, applications programming and hardware. An individual who can coodinate all the software and hardware resulting in a complete system to be delivered on time to a customer. Lots of experience with computers is required for a very nontrivial system. A very important corporate job! Take charge individual needed to deliver customer systems and reduce existing backlog.

TURNKEY ENHANCEMENTS: As we integrate new customer systems we need an experienced individual to make enhancements to tailor systems to specific customers. Because of the amount of software involved (nearly 100,000 lines of Fortran and assembly coding) this is definitely not a job for a beginner. Many of the programs are extremely complex.

PROGRAM LIBRARIAN: This individual would check out new versions of utility programs, coordinate releases of in-house software systems and be responsible for test results. This is an entry level position which could lead to other more technically demanding work.

TELEMED provides a stimulating and challenging environment for highly qualified individuals. We have two Xerox Sigma 5 computers, two DEC KI10 computers and 5 minicomputers of various manufacture. We have been described as the largest realtime medical data processing facility in the world. We provide resources to maximize your efficiency and technical achievements through your own CRT for timesharing or hands on minicomputer machine time. Our rapid growth creates advancement possibilities for the future. Please indicate areas of interest in reply:

TELEMED CORPORATION
Software & Professional Recruitment
TELEMED CORPORATION
2345 Pembroke Avenue
Hoffman Estates, IL 60195
An Equal Opportunity Employer M/F

REPRESENTATIVES WANTED

We are a young company marketing a unique, micro-processor based terminal, using a handheld OCR-Wand for input, to solve defined problems in inventory control, order entry, and distributed data collection. Ideal reps would have end-user sales experience in hardware systems. This is a new opportunity with exceptional potential in an exciting growth area. Most regions open. Please reply to:
Elvin E. Smith, Vice President, DataPhase Systems Inc., 4528 Belleview, Kansas City, Mo. 64111 (816) 931-7927

PROGRAMMER ANALYST

IBM 370-125 DOS-VS Installation with 3270's. Need an individual with proven analysis experience, IBM, OS or DOS and COBOL. Competitive salary and excellent fringe benefits.

Send resume to:
Personnel Manager
BLUE CROSS-BLUE SHIELD OF WYOMING
P.O. Box 2266
Cheyenne, WY 82001
Equal Opportunity Employer m/f

BAL/CICS Programmer ANALYST

S.F. VALLEY, CA

35 year old National Corp. desires to add to its staff a degreed programmer/analyst whose background includes manufacturing, on-line and data base programming and design experience. New 370/125 installation. Good starting salary, company paid profit sharing and stock bonus programs.

Please forward resume to:
CW Box 4734
797 Washington St.
Newton, MA 02160

DUNHILL

All Jobs Fee Paid

Hardware Analyst	$25,000
Data Base Administrator	25,200
DP Security Analyst	22,800
Programmer/Analyst	20,000

Business Systems (COBOL)
Engineering (FORTRAN)
Process Control
Real Time Command & Control

Dunhill
EMPLOYMENT AGENCY of FORT WORTH, INC.
901 Ridglea Bank Bldg.
Fort Worth, Tex 76116
(817) 732-8191

PROJECT LEADER

Excellent growth opty with fast-growing Boston area mfg co. This position requires above average technical skills + proven ability to interface w/user mgmt. You should have strong COBOL prog skills, exp designing acctg/fin'l systems & the ability to learn new concepts quickly. Salary to $20K (fee paid). Contact Bill Grady (in confidence).

ROBERT HALF PERSONNEL AGENCIES
140 Federal St.
Boston, Mass. 02110
(617) 423-6440

PROGRAMMER/ANALYST

Liberal Arts College

20 miles from NYC, seeks qualified individual to join the programming & systems group. At least 3-5 yrs experience; knowledge of PL/1 a must, COBOL, DL/1, CICS. Experience in college work and on-line systems a plus. Excel benefits including 1 month vacation. Send confidential resume & salary history to:
Antony Halaris, Director
Iona College Computing Center
New Rochelle, N.Y. 10801

SOFTWARE OPPORTUNITIES

systems programmer

Requires 5-6 years experience in systems programming with IBM 360 or 370 OS/VS system. Person should have knowledge of SYSGEN, Assembly language, PL/1, FORTRAN, COBOL, and JCL utilities.

Will be responsible for operating systems maintenance, software support work, installation of new software and user support. Equipment utilized is a 370-158, OS/VS1 with RES support.

software engineer

Requires BS degree in Electrical Engineering or Computer Science. Person should have experience with IBM 370, JCL, FORTRAN, and PL/1. Experience programming minicomputers in Assembly and FORTRAN languages required. Work will involve scientific programming and analysis in an engineering environment.

These positions offer a good starting salary and benefits program and an attractive opportunity for growth. If interested and qualified, please submit resume and salary requirements to: Employment Manager.

Itek
Optical Systems
A Division of Itek Corporation
10 Maguire Road
Lexington, Massachusetts 02173

An Equal Opportunity Employer M/F

SOFTWARE

Computer Associates Incorporated, one of the world's leading independent software development and marketing organizations recently purchased the Software Division of Standard Data Corporation and is seeking top computer professionals in the following areas:

Market Representatives

Our product line includes the highly successful CA-SORT system with over 800 installations throughout the world as well as other software products for DOS, OS, VS and a full line of software for VM/370. Sales reps are needed for territories throughout the United States and Canada. Previous experience with system type packages is desirable. If you are not afraid to work and want to be well compensated for your efforts, contact us.

Systems Development

This position requires individuals who can work with a minimum of supervision. Background to include software system programming for IBM 360/370 series. Candidates must have experience on DOS and/or DOS/VS internals. Teleprocessing experience is desirable. Excellent opportunity to develop with a dynamic software company and join the exciting world of software products development.

Starting salary is excellent and full insurance benefits are provided.

Please send resume to Mr. Charles B. Wang, president, Computer Associates Incorporated, 655 Madison Avenue, New York, NY 10021. Or call (212) 355-3333.

COMPUTER ASSOCIATES

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SR. SYSTEMS ENGINEER

Aggressive, innovative problem solver to participate in developing and installing life insurance systems.

A progressive leader in the life insurance industry has opportunities available for several individuals with 3 or more years experience in Data Processing. If you are presently working for a life insurance company or consulting firm and possess current programming skills in IBM ALC or COBOL under DOS or OS, consider this opportunity to join an outstanding team.

Experience in CFO or Life/70 helpful.

Call or send your resume to Randolph (Jack) Edwards today. Jack has been in life insurance data processing and consulting for 18 years, and can tell you where the best opportunities are.

Randolph (Jack) Edwards
F.L.M.I.

DATA PROCESSING CAREERS,
7715 Chevy Chase Dr., Suite 125
Austin, Texas 78752
(512) 452-0971
Personnel Consultant

Faculty Positions in Computer Science

Department with programs in Business, Arts & Sciences, Engineering and Journalism seeks two assistant professors. Ph.D. preferred. September and January openings. September 30 closing for applications.

One position requires knowledge and experience in business data processing, including structured programming in COBOL and RPG, experience in database management system technology and familiarity with at least one functional system.

The other requires knowledge of operating systems and systems software principles, experience in implementing advanced operating systems and/or higher-level language compilers.

Visiting and interim professor and postdoctoral inquiries are also sought for positions in a challenging program in very pleasant surroundings.

Forward resume to R.A. Ramey, Acting Chairman, Intercollege Department of Computer and Information Science, 512 Weil Hall, University of Florida, Gainesville, Fla. 32611.

Mini-Computer Programmer

A rapidly growing software firm has an immediate opening for an experienced mini-computer programmer. Applicant should have experience on the Varian V-70 series or other mini used as a Front End Processor in the financial or thrift industry. Excellent opportunity for growth. Salary commensurate with education and experience. If interested mail resume to:

PAN AMERICAN SYSTEMS CORP.
110 E. Morse Blvd.
Winter Park, Fla. 32789
Attn: Mr. Tom Hardy

SENIOR SYSTEMS PROGRAMMER

Central New Jersey subsidiary of a Fortune 50 company has immediate opening for qualified senior systems programmer in its MIS Technical Services department.

Challenging career opportunity exists for technically competent applicant with minimum 3 years systems programming experience plus extensive IBM 360/370 DOS background in a heavy multiprogramming/spooling environment. Programming languages used are BAL and COBOL.

It is advantageous if background includes a working knowledge of current software (Librarian, JASPER, ASAP, CA-Sort, AMIGOS). Previous experience utilizing software/hardware tools for system performance evaluation and tuning is a plus.

To technician with good communicative skills and proven ability to evaluate, generate, implement and maintain software/hardware requirements, we offer attractive benefits in a corporate group servicing multiple locations.

Please send resume in confidence including present salary to:

CW Box 4738
797 Washington St.
Newton, Mass. 02160
Equal opportunity employer M/F

Computer Operator

Experienced on IBM System 3, Model 10 or 12. Knowledge of RPG 2 Helpful. Looking for a real hands on, capable operator who can assist in managing an excellently designed system. Office located in Northern Bergen County. Send resume with salary requirements to:

CW Box 4736
797 Washington St.
Newton, Mass. 02160

SYSTEMS ANALYST

PACER Systems, located in Arlington, Virginia has openings for Systems Analysts. Desired backgrounds include: simulation and gaming, system design, operating systems, real-time computation, and graphics. PACER Systems has an excellent company paid benefits package and provides an attractive work environment in the Crystal City complex. Resume and salary requirements to:

PACER SYSTEMS, INC.
Dept. SG
1755 S. Jefferson Davis Highway
Arlington, VA 22202
An equal opportunity employer.

COMPUTERS

Exceptional opportunity for a person to take charge of our internal computer operations. Must have thorough knowledge of programming, mini computers, assembly language, and a strong background in typesetting applications. Must have knowledge of hardware and in-line interfaces.

If your background and experience meet our needs we will offer a commensurate salary with all fringe benefits and profit sharing.

Send resume including salary desired to

VP Operations
CW Box 4735
797 Washington St.
Newton, MA 02160
All information will be kept strictly confidential

COLORADO STATE UNIVERSITY

CSU is seeking Senior Systems Analysts and Analyst/Programmers to contribute to state-of-the-art research and development activities at CSU. Required are an M.S. in Engineering, Mathematics or Computer Science and at least six years experience in the data processing field with project-oriented developmental work in engineering simulation or modeling. Applicants should have experience with a wide range of systems, software languages and hardware mainframes. Present Computer Center resources include a CDC 6400 and CYBER 172, supporting batch, RJE and TS; graphics and microfilm. CSU, with an enrollment of 18,000, is located in a rural setting at the foot of the Rockies. Refer applications, including salary history, to Thomas McCall, University Computer Center, Fort Collins, Colorado 80523.

An Equal Opportunity/ Affirmative Action Employer

TERMINAL SYSTEMS DIVISION
Cambridge, Ohio

ELECTRONIC DESIGN ENGINEERS

Truly innovative engineers will find a breadth of challenge in the design and development of paeripheral devices associated with Retail Point-of-Sale terminal system with NCR's P.O.S. division in Cambridge, Ohio. Candidates should be proficient in digital circuit design and have some exposure to microprocessors. Your involvement with the product is complete — from conception through production allowing maximum visibility.

A degree and from 2-5 years appropriate experience will provide the necessary credentials for placement.

DATA COMMUNICATION SYSTEMS ENGINEERS

To evaluate data communication module and equipment for applicability in Retail Point-of-Sale terminal systems. Will generate standards for data communication circuit handshaking and will propose future communication products. To provide support for data communication system analysis and proposals for future retail systems.

Candidates should bring a degree and a good understanding of Binary Synchronous (BSC), ANSI Asynchronous and SDLC Control procedures. Knowledge of Modems, Communication adapters, and Communication procedures essential and a knowledge of Common Carrier facilities desirable.

These 2 opportunities in our Retail System Architecture organization are highly visible positions and offer strong exposure and growth.

NCR's P.O.S. facility is located in a lovely rural community in east central Ohio.

We invite you to join us and your inquiry is the first step.

Robert W. Donovan
Terminal Systems Division - Cambridge
NCR Corporation
Cambridge, Ohio 43725
Phone: (614) 439-0398

NCR

An Equal Opportunity Employer

LIFE INSURANCE SOFTWARE

The acceptance of our life insurance application software products and services is creating professional opportunities for analyst/prog rammers, installation project managers, systems/programmers, operation specialists, and administrators with 3 to 5 years experience in life insurance software. If you are considering a position change in the next 12 months, let us talk with you now so that we will both be able to plan for the future.

Our systems involve interactive on-line, CICS, both OS and DOS, RJE - (HASP), RES, and data base management concepts. We anticipate having opportunities in all major geographic locales.

Please call collect or send resume to: Ms. Coomes

informatics inc | Equimatics Product Services Division

1025 Elm Street, Suite 1000 Dallas, Texas 75202
Phone: (214) 744-4342

We are an operating unit of Informatics Inc., a subsidiary of The Equitable Life Assurance Society of the United States. An equal opportunity employer, M&F.

MINI-COMPUTER SOFTWARE SYSTEMS OPPORTUNITIES
With The Trend Setter in Typesetting!

We're a leading designer and manufacturer of modern computerized typesetting equipment — pioneering in improving the state-of-the-art in timesharing operating systems and networks for the graphic arts industry. Tremendous demand for our products has resulted in many new and challenging career opportunities such as the positions immediately available outlined below:

SUPERVISOR
Software Systems Acceptance Test

We're looking for 3-5 years software systems testing as well as a minimum of 2 years experience in mini-computer operating systems development. Graphic arts industry would be desirable, but is not essential. Your responsibilities will include designing, implementing, and supervising the performance of tests (including their criteria) utilized to accept new or revised software. You'll also become involved with presales support and presentations; providing installation and support functions within the Technical Support Group for assigned product lines; design and programming of customized software to customer specifications; and debugging after installation.

PROGRAMMER
Systems Support

Can You Deal With Customers . . .
And Solve Their Problems?

You should have 3-5 years systems support experience in developing and testing assembly language mini-computer software systems. You must be customer oriented and willing to travel extensively to their locations.

These positions carry excellent compensation programs including good starting salaries, comprehensive benefits, and plenty of chances to increase your professional knowledge while moving up. To explore what we have to offer each other further, please forward your confidential resume, indicating specific position in which you are interested as well as your salary history and requirement to:

Nicholas E. Rao, Personnel Administrator, Dept. C.

Mergenthaler
a Eltra company

MERGENTHALER LINOTYPE COMPANY
MERGENTHALER DRIVE PLAINVIEW NEW YORK 11803
Equal Opportunity Employer M/F

CAN YOU MEET OUR CHALLENGE?

Expansion of National Steel Corporation Western Region Data Center has created challenging positions in System Development, Scientific Analysis, and Software Programming. Located in Granite City, Illinois, 10 minutes from St. Louis, we offer competitive salary and benefits, plus the satisfaction of working on innovative projects in a stimulating environment. Facilities include IBM 370/158 and 370/155 operating in VS environment.

We need talented people with experience in one or more of the following areas:

SYSTEMS ANALYSTS

- 2-5 years design of cost accounting systems
- 1-3 years design of traffic and freight systems
- 2-3 years experience in sales order entry and reporting
- 2-3 years design of inventory control system preferably in the steel industry
- 1-3 years design of financial systems

MANAGEMENT SCIENCE ANALYST

- 2-3 years operations research experience utilizing linear programming, GPSS, GASP, CPM, PERT, and math modeling

SYSTEMS PROGRAMMER

- 2 years experience in VS 2/1.7 or OS/MVT, HASP, and TCAM-3705

If you are seeking a new challenge and rewarding opportunity, we invite you to send your resume to A.P. Adelsberger:

National Steel Corp
Granite City, IL 62040

An Equal Opportunity Employer M/F

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DATA BASE CONSULTANT

Leading International Data Base Management consulting firm is seeking qualified professionals. A minimum of five years' experience required, with skills in IMS and one of the following: TOTAL, ADABAS, SYSTEM 2000 or CODASYL based systems. Experience in public speaking, and the ability to communicate effectively both verbally and in writing is essential.

Compensation commensurate with experience. Send resume to:

CW Box 4737
797 Washington St.
Newton, MA 02160

SOUTHEAST OPPORTUNITIES

Work and Live In the Sunny Mid-South

Project Leaders	to $21,000
Senior Analysts	to $18,500
Programmer Analysts	to $18,000
Programmers	to $16,800

Manufacturing, Insurance, Financial, Banking. Mostly 360-370 OS COBOL environments some growing RPG II, Assembler, Neat/3. All fees employer paid. Call, send resume or write including salary history and machine & language experience: Martin Grant, Business Men's, Inc., Box 1355, Columbia, SC 29202. (803) 799-0381.

WILLING TO RELOCATE?

Positions available for qualified personnel in all areas of Data Processing Industry. Software & Hardware. Foreign & Domestic. $20 to $75K. Send resume, desired location & salary.

* * * * * * * * * * *

We also desire individual with Executive Recruitment & Search background to manage Data Processing Recruiting Div. Excellent opportunity for advancement. **Nationwide Executive Search, Inc., Fox Pavilion, Jenkintown-Phila., Pa. 19046 (215) 885-6006.**

FINANCIAL SYSTEMS ANALYST

Key position available at leading Southwestern University. Responsible for designing and implementing Financial Systems. BS/BA, advanced degree desirable. Salary commensurate with qualifications, excellent benefits including tuition waivers. Resume by August 27, 1976 to F.C. Forney, Texas Christian University, P.O. Box 30030A, Fort Worth, Texas 76129.

TCU is an Affirmative Action/ Equal Opportunity Employer

Computer Sales

An exceptional opportunity to participate in the booming distributed processing market with a company that has grown from $5-50 million in the last three years.

As a Four-Phase Systems Marketing Representative, you'll have personal responsibility for selling and installing our advanced family of distributed processing systems in major business, financial and government organizations.

Your background in mainframe sales, data communications and data entry will be complemented by extensive training at our headquarters Network Marketing Center on the San Francisco Peninsula. Then you'll join our nationwide team of system professionals with branch offices in 30 cities.

If you're looking for outstanding growth with a dynamic vertically integrated company and can demonstrate a record of increasing success in business data processing sales, send your resume and salary history to: **James Jordan, Nat'l. Sales Manager, Four-Phase Systems, 19333 Vallco Parkway, Cupertino, CA 95014**

Four-Phase Systems
Advanced Technology for Distributed Processing

An Equal Opportunity Employer

DRC

Grow with us!

Dynamics Research Corporation is a firmly established and diversified organization engaged in a wide range of government and industrial markets. We are located in Suburban Wilmington, Massachusetts, not far from the New Hampshire border and within easy commuting distance of metropolitan Cambridge and Boston.

COMMUNICATIONS PROGRAMMER

We have an immediate need for an individual to support our data communications software and hardware. You will be responsible for the communications on a Honeywell-6000 DN355 and a Honeywell G-437 DN30. You should have at least 2 years' experience with GRTS software and solid knowledge of modems, multiplexors and other communications hardware.

To apply, please call Al C. Stauffer at (617) 658-6100, or send a resume to his attention at the address below.

DRC
DYNAMICS RESEARCH CORPORATION
60 Concord St., Wilmington, Mass. 01887

An equal opportunity employer

Operating Systems Software Support Specialists

We currently have ideal career opportunities for "hands-on" doers who are performance oriented. Our large-scale systems group, located in Marlboro, Mass. needs Systems Programmers to provide worldwide software maintenance and technical support. We also need several individuals to support our in-house development computer centers.

You'll be providing support for DECsystem-10 and DECsystem-20 operating systems. You'll need 1-3 years of software background, plus experience in operating systems software. PDP-10 operating systems is an additional asset.

We want individuals who can assume problem solving assignments now for some of the largest and most sophisticated time-sharing systems in the industry. These high visibility positions can provide a foundation for further growth in the areas of software development, software management or marketing.

If you're interested in professional growth, direct your resume to Julia G. Michaelson, Digital Equipment Corporation, 200 Forest St., Marlboro, Mass. 01752.

digital
digital equipment corporation

an equal opportunity employer m/f

EMI

ENGINEERS AND PROGRAMMERS

Computerized Body and Brain Scanners

EMI Medical, Inc., a subsidiary of EMI Ltd., manufactures, markets and services computerized tomographic brain and body scanners for all of North America. As the acknowledged leader in the field of computerized tomography, we have unique opportunities for exceptionally talented professionals.

MANAGER, MANAGEMENT INFORMATION SYSTEMS

Requires ten years MIS experience with the last three years directly involved in management of on-line systems. Experience with mini computers and main frames is a must and data base experience is desirable. Masters Degree in related field is required.

MANAGEMENT INFORMATION SYSTEMS ANALYSTS

Involves design of on-line business systems. Knowledge of inventory control systems, financial systems and manufacturing systems is necessary. Masters Degree or equivalent in Business Administration, Computer Science or Industrial Engineering is required.

MANAGEMENT INFORMATION SYSTEMS PROGRAMMERS

Will be involved in implementing various on-line business systems. Must have experience in real-time applications, data base systems communications network. Bachelor of Science Degree or equivalent is required.

COMPUTER SOFTWARE ENGINEERS

Requires in-depth experience of at least five years in several of the following: Computer operating systems, real time systems, data management, and systems diagnostics. Knowledge of a range of scientific programming languages would be a plus. Requires Masters Degree or equivalent in Computer Science.

These positions offer unique opportunities to contribute significantly to our leadership position and at the same time dramatically enhance your own career development. As with our products, you'll find our compensation, incentive plans, and other benefits also make us a leader. We are headquartered in Northbrook, Illinois, an attractive Northern suburb of Chicago.

For immediate confidential consideration send detailed resume including salary history to: Personnel Department.

EMI MEDICAL INC
3645 Woodhead Drive
Northbrook, Illinois 60062
An Equal Opportunity Employer M/F

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Customer Service Engineers

25 Openings Worldwide. Experience with PDP 11/45.

We're specialists in "Customer Engineer" Extractions.

Bill Gill and Associates
5724 W. Diversey Av.
Chicago, Ill. 60639
(312) 622-7711

COMPUTER SYSTEMS ANALYSTS

- Bachelor's degree and Systems Analysis experience required

DATA PROCESSING PROGRAMMERS

- Bachelor's degree preferred
- Programming experience, preferrably cobol, required.

$15,248 to $22,228 per year

Junior, Intermediate, and Senior positions available

- Starting level depends upon experience

For application, send resume to.

CITY OF DETROIT
Personnel Department
314 City-County Bldg.
Detroit, MI 48226
A Merit System and An Equal Opportunity Employer

PROGRAMMER/ANALYST

Expansion has created two career positions for Programmer/Analysts with Systems Design exp and the ability to program in COBOL or BAL for the 360 under DOS.

Salary commensurate with experience plus company paid retirement plan, life insurance, health insurance, disability plans.

Qualified applicants please send resume including salary requirements to:

Manager Systems and Programming

STANDARD DATA CORP.
1540 Broadway
New York, N.Y. 10036
An Equal Op. Employer M/F

Manager—ADP Services

Candidate must have proven ability to establish rapport with all aspects of the college including students, faculty, staff, administrators, and the professional community. May be required to assist in debugging student programs. Must have technical expertise in state-of-the-art software/hardware.

Preferred Qualifications: Doctorate and minimum of four years data processing management. DEC 11/45 RSTS, HIS 2020, CDC 3300 experience. Calendar year position. Competitive salary. Selected applicants will be invited for a personal interview at their expense. Send request for job announcement to Dr. John C. Biddle, California State College, Bakersfield, 9001 Stockdale Highway, Bakersfield, CA 93309. California State College, Bakersfield, is an equal opportunity employer.

EDP POSITIONS

Several positions from $15K-$45K are now available with our client companies in Systems Mgt., Sales, Manufacturing and Operations.

Our clients are located throughout the S.E., South and S.W. and are in the following industries:

Banking, Insurance, Data Processing Services, Manufacturing, Engineering, Petro-Chemical.

Send resumes and salary history in confidence to:

W. TAYLOR INTERNATIONAL PERSONNEL CONSULTANTS
4615 N. Freeway, Suite 103
Houston, Texas 77022
(713) 691-3969

DATA PROCESSING MANAGER

Data processing manager wanted to head up data processing for physician's clinic in north central Wisconsin. Applicant should have experience with Burroughs medium systems, and M.I.S. including on-line systems data communication and data base management. Prior programming experience desired. Competitive salary with exceptional benefits and living conditions. Please send resume including salary history to: Personnel Manager, Marshfield Clinic, 1000 North Oak Ave., Marshfield, Wis. 54449. *Equal opportunity employer M/F.*

ANALYST/ PROGRAMMER

Rapidly expanding Insurance Marketing area of a large Gulf Coast insurer necessitates search for an aggressive Analyst/Programmer. Experience in Pension Proposal, Insurance Ledger, and related systems is required. APL programming experience is highly desirable but not required. If you are seeking a career growth opportunity, send resume to:

CW Box 4733
797 Washington St.
Newton, MA 02160
An Equal Opportunity/ Affirmative Action Employer M/F

FACULTY OPENINGS:

Chairperson, Department of Mathematical Sciences: Majors, Math. Computer Science, Operations Research. Teach Advanced Statistics, Stochastic Processes, Operations Research, Theory of Scheduling. Ph.D. able to teach Operations Research required.

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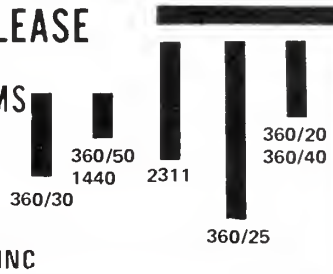

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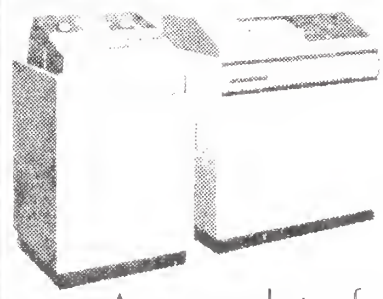

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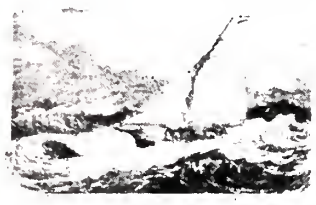

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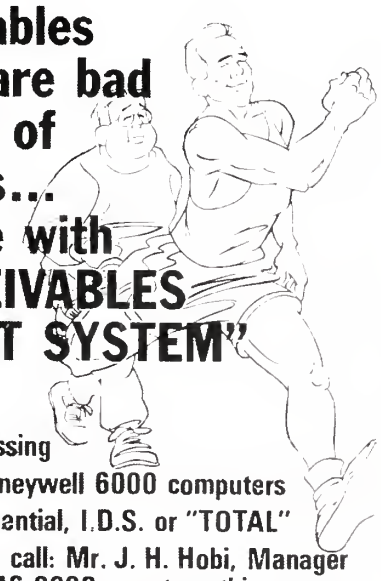

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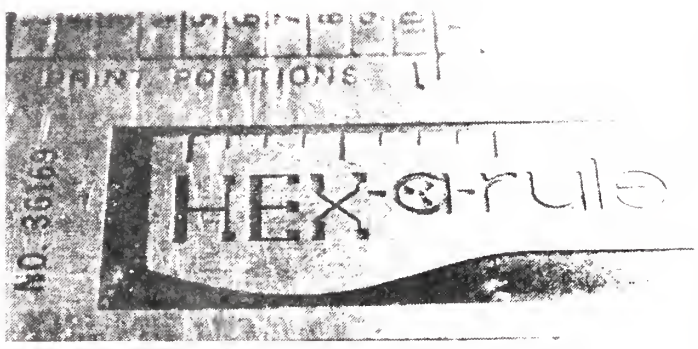

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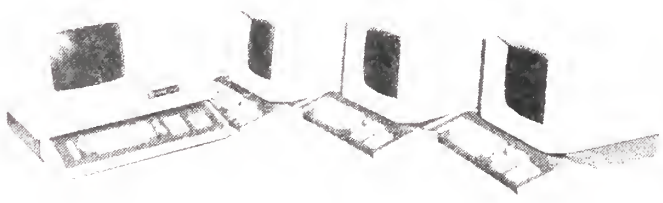

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But Dipped in First Quarter

Pertec Earnings Better Than Expected

MARINA DEL REY, Calif. – Although Pertec Corp.'s first-quarter results were better than the firm had anticipated, earnings were less than those of the year-ago quarter.

The results for the quarter included those of Computer Machinery Corp. (CMC), acquired on March 30.

"CMC, which had recorded sizable losses from operations in the three quarters prior to the acquisitions, achieved a better than break-even performance in our first quarter," according to Ryal R. Poppa, Pertec president.

"This places the potential recovery of the CMC Group ahead of our earlier anticipations and allows us to be more optimistic than in the past regarding Pertec's return to previously attained profit levels," he added.

Pertec's Peripheral Equipment Division is having a record year with quarterly revenues up 27% and income 43% ahead of last year's comparable period, he said.

However, as anticipated, income and revenues declined at the Business Systems Division (BSD) compared with the year-ago period.

Poppa believes the BSD has "leveled off and will now show improvement in each successive quarter for the remainder of fiscal 1977."

Pertec's revenues rose to $21.3 million in the quarter compared with $13.5 million in the same period last year.

Earnings, however, dropped to $874,000 or 17 cents a share compared with $956,000 or 31 cents a share in the period ended June 27, 1975.

Backlog increased to $85 million at the end of the quarter compared with $64.8 million at the end of the previous fiscal year.

Pertec has received initial notice from the purchasers of CMC's French and German subsidiaries that certain breaches of warranties exist regarding representations and warranties made to them, the company said.

However, it added, it does not believe the outcome will have a materially adverse effect on the financial condition of the company.

Wyly Revises Recapitalization Plan And Indicates Datran On the Block

DALLAS – In yet another effort to keep fiscally afloat, Wyly Corp. has revised its recapitalization plan which, if completed, would reduce its consolidated debt about $95 million and its estimated 1977 interest payments on debt by $6.7 million, according to the company.

Wyly has indicated its Data Transmission Co. (Datran) unit is for sale because it is unable to satiate Datran's large cash appetite.

In addition to two new issues of convertible preferred stock and a one-for-two reverse split of its currently outstanding common, the recapitalization plan includes the "quasireorganization" accounting procedure which would eliminate the deficit in Wyly's retained earnings account by a charge to paid in capital.

Wyly has filed the plan with the Securities and Exchange Commission.

The firm indicated it doesn't expect to be able to pay a $1.4 million semiannual interest installment due Sept. 15 on its 7.25% debentures.

Wyly plans to ask debenture holders to tell the debentures' trustee, Citibank, not to speed up maturity of the issue if it does not meet the payment by the end of the grace period on Oct. 14, it said.

In the event this payment is not made and holders of 25% of the debentures amount declare the principal due, Wyly said it will ask them not to demand payment or bring proceedings to collect the money.

If the payment is not made, the firm observed, either Citibank or holders of the 25% principal amount of the debentures could declare the $39 million principal amount of the issue due immediately.

The recapitalization plan, subject to approval by shareholders, 90% of its 7.25% debenture holders and all holders of its 4% capital notes, calls for holders to exchange these issues for a new Series A convertible preferred and Wyly common.

Originally the plan was to exchange these issues for 6% convertible debentures.

In addition, the plan also calls for Walter Haefner Holding AG of Zurich, Switzerland, to convert certain of its holdings into a new class of Series B convertible nonvoting preferred stock rather than shares of a new nonvoting class of common stock as previously proposed.

In exchange for the new Series B stock, Haefner is to convert $43.1 million in notes and debentures of Wyly and Datran and $3.9 million of Datran, both of which are secured by substantially all assets of Wyly and Datran, as well as a $5.4 million Wyly note.

SEC Snag Delays Issue of Amdahl

NEW YORK – The initial public offering of nearly 1.1 million shares of Amdahl Corp. common stock ran into a snag recently when the Securities and Exchange Commission (SEC) held up the release pending a resolution of differences between it and Amdahl and its accountant, Arthur Anderson & Co., over the treatment of the sale of a 470V/6 to a Canadian customer last month.

Scheduled to be released Aug. 5, the issue will be available Aug. 12, according to a spokesman for The First Boston Corp., managing underwriter.

The SEC objected to Amdahl's treatment of the transaction as a sale, indicating it should have been treated as an operating lease.

Amdahl sold the 470V/6 to Canadian Pacific, which obtained financing from Mitsubishi Bank. The terms of the agreement provided that if Canadian Pacific wanted to terminate the lease at the end of four years, Amdahl would pick up the difference, if any, between the current market value and half of the $880,000 remaining under a six-year amortization schedule.

Fujitsu would pick up the other half, the First Boston spokesman said.

In order to expedite the offering, an amendment to the prospectus was filed which satisfied the SEC's definition of a sale, he added. Amdahl agreed to pay Mitsubishi Bank $44,000 to take the full risk of assuming any differences in the value of the machine should Canadian Pacific terminate the lease after four years, he said.

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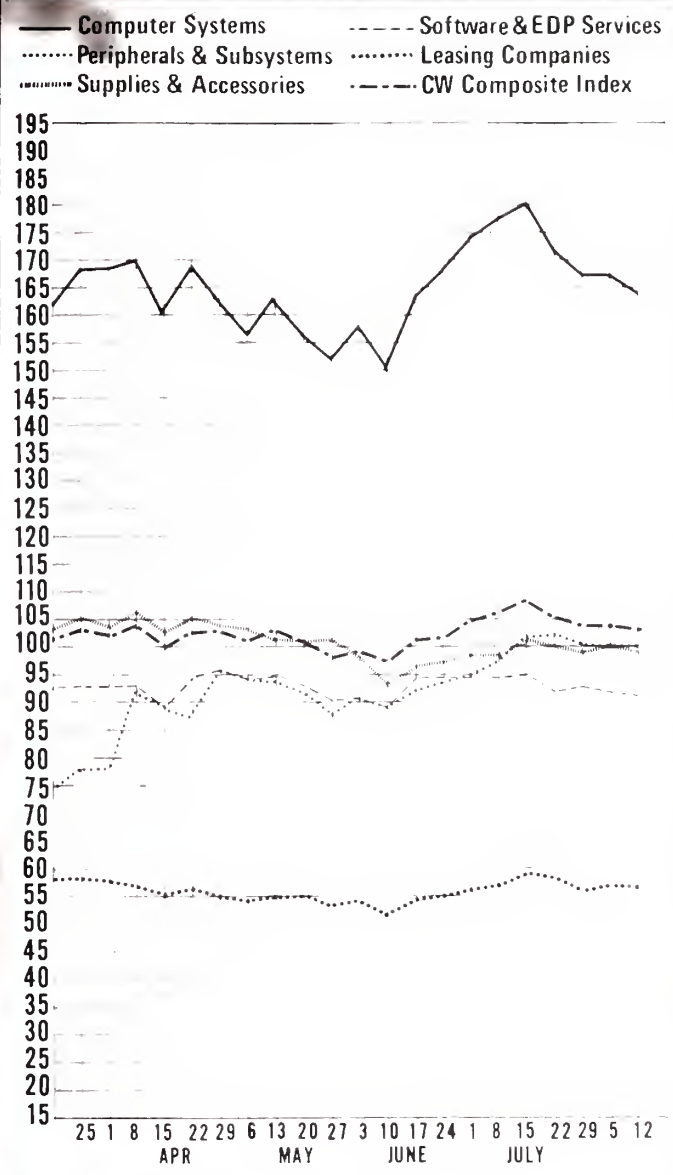

Earnings Reports

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Three Months Ended June 5

	1976	1975
Shr Ernd	$.48	$.35
Revenue	39,624,000	24,873,000
Earnings	4,621,000	2,915,000
9 Mo Shr	1.27	1.05
Revenue	102,736,000	73,631,000
Earnings	12,140,000	8,597,000

ANDERSON JACOBSON
Year Ended March 31

	1976	1975
Shr Ernd	$.35	$.27
Revenue	17,341,893	13,360,309
Earnings	864,431	663,906
3 Mo Shr	.09	.08
Revenue	4,570,760	3,929,146
Earnings	217,768	185,645

DATAPOINT
Three Months Ended March 31

	1976	1975
Shr Ernd	$.54	$.50
Revenue	19,506,000	12,287,000
Tax Cred	.....	336,000
Earnings	1,669,000	1,097,000
9 Mo Shr	1.61	1.48
Revenue	50,610,000	33,200,000
Tax Cred	495,000	975,000
Earnings	4,561,000	3,090,000

DATAPRODUCTS
Year Ended March 27

	1976	a1975
Shr Ernd	$.98	$.85
Revenue	85,085,000	85,938,000
Earnings	b7,076,000	5,818,000
3 Mo Shr	.30	.22
Revenue	23,397,000	20,709,000
Earnings	2,194,000	1,527,000

a-Restated to treat Data Card Corp. as unconsolidated subsidiary. b-Includes $615,152 gain from sale of Data Card subsidiary.

ENNIS BUSINESS FORMS
Three Months Ended May 31

	1976	1975
Shr Ernd	$.24	$.22
Revenue	14,854,532	13,401,468
Earnings	530,253	500,411

GENERAL AUTOMATION
Three Months Ended May 1

	1976	1975
Revenue	$14,518,000	$13,178,000
Loss	1,425,000	660,000
9 Mo Rev	47,804,000	41,392,000
Loss	1,232,000	2,540,000

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TRADE*QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 11, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

E X C H		1976 RANGE (1)	CLOSE AUG 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	95 1/2	+ 1/4	+0.2
O	COMPUTER AUTOMATION	10- 19	16	- 7/8	-5.1
N	CONTROL DATA CORP	18- 27	23 1/2	- 5/8	-2.5
N	DATA GENERAL CORP	40- 60	49 1/8	-1 7/8	-3.6
O	DATAPOINT CORP	24- 46	38 1/2	- 3/4	-1.9
O	DIGITAL COMP CONTROL	2- 7	5 3/8	- 1/4	-4.4
N	DIGITAL EQUIPMENT	138-131	168 1/4	-1 7/8	-1.1
N	ELECTRONIC ASSOC.	2- 5	2 7/8	- 1/8	-4.1
A	ELECTRONIC ENGINEER.	7- 16	9 1/4	- 3/4	-7.5
N	FOXBORO	28- 47	44 5/8	-2 1/4	-4.7
O	GENERAL AUTOMATION	5- 11	7 1/2	0	0.0
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	95-117	101 1/4	-5 1/2	-5.1
N	HONEYWELL INC	34- 56	46 5/8	-1 3/8	-2.8
N	IBM	227-280	277 3/8	+ 5/8	+0.2
O	MANAGEMENT ASSIST	1- 3	2 1/4	-	-2.7
O	MEMOREX	19- 33	25	-1 7/8	-6.9
O	MICRODATA CORP	10- 27	26 1/2	+ 1/2	+1.9
O	MODULAR COMPUTER SYS	5- 14	5 3/4	+ 1/4	+4.5
N	NCR	24- 36	34	- 1/8	-0.3
O	PRIME COMPUTER INC	4- 14	13 1/4	0	0.0
N	PERKIN-ELMER	19- 27	21 3/8	+ 5/8	+3.0
N	RAYTHEON CO	45- 66	63 3/8	+ 3/8	+0.5
N	SPERRY RAND	40- 52	47	+ 1/8	+0.2
O	SYCOR INC	20- 31	22 3/4	+1 1/4	+5.8
A	SYSTEMS ENG. LABS	6- 10	8 1/4	- 1/8	-1.4
N	VARIAN ASSOCIATES	13- 17	14 1/4	- 1/4	-1.7
A	WANG LABS.	11- 20	15 1/4	- 1/4	-1.6

LEASING COMPANIES

O	COMDISCO INC	3- 10	7 1/2	0	0.0
A	COMMERCE GROUP CORP	2- 3	2 5/8	- 1/8	-4.5
A	COMPUTER INVSTRS GRP	1- 3	1 7/8	- 1/8	-6.2
M	DATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/8	+	+10.0
N	DPF INC	5- 8	7	- 1/4	-3.4
A	GREYHOUND COMPUTER	3- 8	7 1/8	0	0.0
N	ITEL	6- 15	13 1/4	- 1/8	-0.9
N	LEASCO CORP	6- 19	16 3/4	- 1/2	-2.8
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	3/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 1/4	0	0.0
N	U.S. LEASING	7- 12	10 3/8	- 1/8	-1.1

SOFTWARE & EDP SERVICES

O	ADVANCED COMP TECH	1- 2	1 3/8	0	0.0
O	ANACOMP INC	9- 11	9 1/8	- 3/8	-4.4
A	APPLIED DATA RES.	2- 4	3 3/4	+ 1/8	+3.4
N	AUTOMATIC DATA PROC	17 35	33 1/2	- 1/2	-1.4
O	COLEMAN AMERICAN COS	3- 6	2 3/4	- 1/4	-8.3
O	COMPUTER DIMENSIONS	3- 7	5 1/4	- 1/4	-4.5
O	COMP ELECTION SYSTMS	5- 9	5 3/4	- 1/4	-4.1
O	COMPUTER HORIZONS	1- 2	2	0	0.0
O	COMPUTER NETWORK	2- 6	3 1/4	- 1/4	-7.1
N	COMPUTER SCIENCES	4- 8	6 3/8	- 1/4	-3.7
O	COMPUTER TASK GROUP	1- 1	1 1/8	- 1/8	-10.0
O	COMPUTER USAGE	3- 6	2 7/8	+ 1/8	+4.5
C	COMSHARE	2- 9	6 1/2	- 1/4	-3.7
O	DATA DIMENSIONS INC	2- 4	3	0	0.0
O	DATATAB	1- 1	1 1/4	+ 1/4	+25.0
N	ELECTRONIC DATA SYS.	12- 16	16	+1 1/4	+8.4
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 1/2	- 1/4	-14.2
O	IPS COMPUTER MARKET.	1- 2	1	- 1/8	-11.1
O	KEANE ASSOCIATES	2- 4	3	- 3/8	-11.1
O	KEYDATA CORP	2- 5	2 1/4	- 1/8	-5.2
O	LOGICON	4- 4	3 5/8	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/8	- 1/8	-5.5
A	NATIONAL CSS INC	13- 25	22 1/2	+ 7/8	+4.0
A	ON LINE SYSTEMS INC	18- 22	19 1/8	+ 1/8	+0.6
N	PLANNING RESEARCH	3- 5	3 5/8	+ 1/8	+3.5
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	2 1/8	0	0.0
O	REYNOLDS & REYNOLD	13- 21	17 1/2	- 3/4	-4.1
O	SCIENTIFIC COMPUTERS	1- 1	5/8	+ 1/8	+25.0
O	TYMSHARE INC	19- 28	26 1/4	+ 1/4	+0.9
A	URS SYSTEMS	3- 5	4	+ 1/4	+6.6
N	WYLY CORP	2- 7	2 1/4	- 3/8	-14.2

PERIPHERALS & SUBSYSTEMS

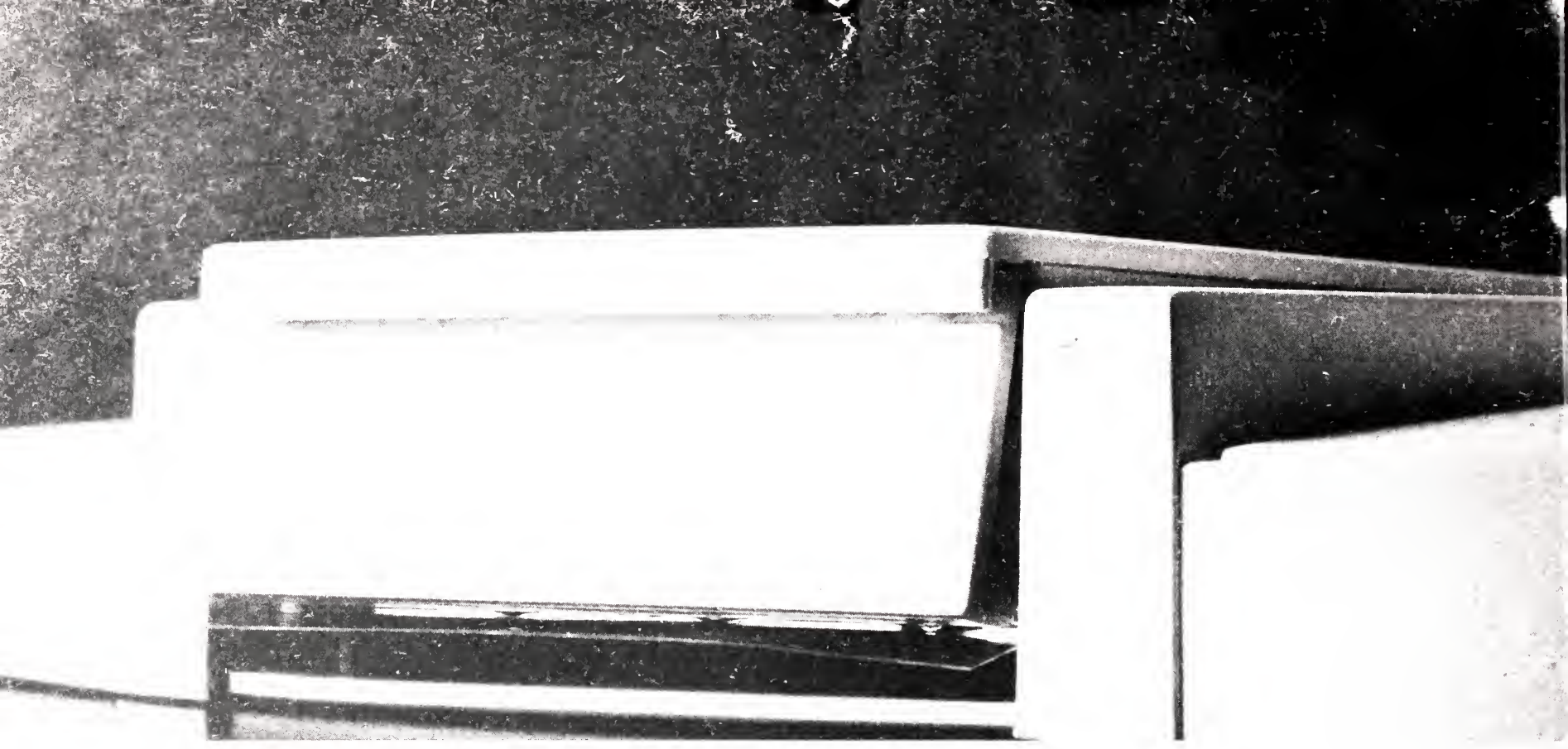
N	ADDRESSOGRAPH-MULT	8- 13	9 3/8	- 5/8	-6.2
O	ADVANCED MEMORY SYS	4- 10	7 1/4	- 1/4	-3.3
N	AMPEX CORP	5- 10	8 5/8	0	0.0
O	ANDERSON JACOBSON	2- 4	2 3/4	+ 1/8	+4.7
O	APPLIED DIG DATA SYS	13- 25	22	0	0.0
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/2	+ 1/2	+6.2
A	BOLT,BERANEK & NEW	7- 11	9 3/8	0	0.0
N	BUNKER-RAMO	5- 10	8 1/4	- 5/8	-7.0
A	CALCOMP	4- 7	5 1/2	0	0.0
O	CAMBRIDGE MEMORIES	0- 6	3/4	- 1/8	-14.2
N	CENTRONICS DATA COMP	20- 36	34	+ 5/8	+1.8
O	CODEX CORP	22- 42	33	+ 1/2	+1.5
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 6	5 1/8	- 1/2	-8.8
O	COMPUTER CONSOLES	4- 7	5 3/4	+ 1/4	+4.5
A	COMPUTER EQUIPMENT	1- 3	1 1/2	- 3/8	-20.0
O	COMPUTER TRANSCEIVER	1- 3	7/8	0	0.0
O	COMTEN	4- 9	7 3/4	- 1/4	-3.1
N	CONRAC CORP	20- 25	22 1/2	- 3/8	-1.6

O	DATA ACCESS SYSTEMS	1- 4	3 1/4	0	0.0
O	DATA 100	7- 13	9	+ 3/8	+4.3
A	DATA PRODUCTS CORP	5- 15	13 3/4	- 1/4	-1.7
O	DATA TECHNOLOGY	1- 2	1 1/2	+ 1/8	+9.0
O	DATUM INC	1- 2	1 1/2	0	0.0
O	DECISION DATA COMPUT	1- 4	1 5/8	- 1/8	-7.1
O	DELTA DATA SYSTEMS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	3	0	0.0
O	FABRI-TEK	1- 1	5/8	- 1/8	-16.6
O	GENERAL COMPUTER SY	1- 2	1 1/8	+ 1/8	+12.5
N	HAZELTINE CORP	4- 12	9 1/8	- 1/4	-2.6
N	HARRIS CORP	34- 54	54	+ 1/2	+0.9
A	INCOTERM CORP	9- 20	10	- 1/4	-2.4
O	INFOREX INC	3- 7	3 1/2	- 1/4	-6.6
O	INFORMATION INTL INC	10- 18	11 1/8	- 3/8	-3.2
O	INTEL CORP	80-109	82 1/2	-1 1/2	-2.3
A	LUNDY ELECTRONICS	4- 7	4	- 1/8	-3.0
O	MSI DATA CORP	3- 7	6 3/4	+ 1/8	+1.8
A	MILGO ELECTRONICS	15- 21	17	-2 3/8	-12.2
N	MOHAWK DATA SCI	3- 10	9 1/8	+ 1/4	+2.8
O	PENRIL CORP	1- 3	1 7/8	0	0.0
A	PERTEC COMP	3- 8	6 1/8	+ 5/8	+11.3
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5	0	0.0
O	QUANTUM CORP	4- 6	5	0	0.0
O	RECOGNITION EQUIP	6- 11	9 1/4	0	0.0
N	SANDERS ASSOCIATES	6- 11	8 1/2	-1	-10.5
O	SCAN DATA	2- 4	2 1/4	0	0.0
O	STORAGE TECHNOLOGY	9- 13	12	- 1/2	-4.0
O	T BAR INC	5- 10	5 3/4	- 1/4	-4.1
O	TALLY CORP.	4- 6	4 1/2	- 1/4	-5.2
O	TEC INC	3- 5	3 3/4	0	0.0
N	TEKTRONIX INC	45- 67	64 3/4	- 1/4	-0.3
N	TELEX	2- 5	3 1/4	0	0.0
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2 7/8	+ 1/8	+4.5

SUPPLIES & ACCESSORIES

O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 5	3 1/4	0	0.0
A	BARRY WRIGHT	6- 13	7 1/2	- 3/8	-4.7
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	29- 42	29 1/8	- 5/8	-2.1
O	DUPLEX PRODUCTS INC	14- 24	14 7/8	+ 1/2	+3.4
N	ENNIS BUS. FORMS	6- 8	6 3/4	+ 1/8	+1.8
O	GRAHAM MAGNETICS	8- 13	9 1/2	- 1/2	-5.0
O	GRAPHIC CONTROLS	13- 19	15 1/2	0	0.0
N	3M COMPANY	53- 65	62	+2	+3.3
O	MOORE CORP LTD	40- 51	41 1/4	- 3/4	-1.7
N	NASHUA CORP	11- 18	17 1/8	- 1/4	-1.4
O	STANDARD REGISTER	15- 19	16 1/4	+ 1/2	+3.1
O	TAB PRODUCTS CO	5- 11	9	- 1/2	-5.2
N	UARCO	21- 25	21	- 1/2	-2.3
A	WABASH MAGNETICS	4- 8	7 1/8	- 1/4	-3.3
N	WALLACE BUS FORMS	19- 25	19 7/8	- 1/8	-0.6

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR



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